

IV. *A Contribution to our Knowledge of the Varieties of the Wall-Lizard (Lacerta muralis) in Western Europe and North Africa.* By G. A. BOULENGER, F.R.S., V.P.Z.S.

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[PLATES XXII.—XXIX. and Text-figures 1–6.]

THIRTY years have now elapsed since special attention began to be paid to a systematic study of the variations of the Wall-Lizard of the Mediterranean basin, our knowledge of which has been so greatly advanced by the publications of Bedriaga, Eimer, Braun, Werner, and others. It is Bedriaga who, by a valuable series of papers, issued between 1874 and 1883, has most contributed to this advance, from the systematic point of view, Eimer's researches being more of a theoretical kind, and almost entirely confined to Italy and Malta. And to Bedriaga also we are indebted for a complete summary of the state of the question in 1886, at which date appeared his great monograph of the genus *Lacerta*, published by the Senckenberg Society. Since that time, however, a much larger material has been examined, and this has resulted in new views on the definition of the races and on their mutual relationships. I have always been keenly interested in the question, and have missed no opportunity of adding to the collection in the British Museum, which is now a very imposing one, both from the point of view of the number of specimens and of the variety of localities.

Of late a tendency has sprung up to greatly multiply the species and thus destroy the old conception of *Lacerta muralis*. I doubt whether such attempts will conduce to a better understanding of the subject, and I have often been struck by the want of discrimination in the selection of characters on which many of these supposed species are founded. Characters of form and coloration are given as distinctive which on examination of even moderately large series of specimens prove to be worthless, whilst others of greater importance have been overlooked or neglected¹. The object of this paper is to supply detailed descriptions of the specimens in the British Museum, and by drawing special attention to the individual variations, which are so frequently passed over in systematic definitions, to furnish a sounder basis for future work. I have endeavoured at the same time to review the work of my predecessors, so far as I

¹ Eimer, for instance, attempted to classify the variations according to the pattern of coloration and the shape of the head, practically neglecting everything else. His work, therefore, although extremely interesting and containing much that is true as regards the derivation of markings, cannot be said to have advanced our knowledge from the systematic and zoogeographical points of view.

have been able to have access to type specimens. For this purpose I have been fortunate in being allowed to utilise the collection of M. F. Lataste, which has been entrusted to my care, and to compare many of the type specimens described by Dr. de Bedriaga, which have been acquired for the British Museum since the publication of the 'Catalogue of Lizards.' I am also greatly indebted to Count Peracca for friendly criticism and much important material in connection with this work, and to Dr. de Bedriaga, Prof. Camerano, Dr. Gestro, Dr. Werner, Dr. Vinciguerra, Prof. Monticelli, M. F. Doumergue, the Rev. Fathers G. Fournier and T. Nève, Dr. Gadow, M. Dollo, Sr. A. Ferrer, Hr. Lorenz Müller, Dr. J. Roux, Mr. Bryan Hook, and Prof. I. Bolivar for loan or gift of specimens.

This paper does not profess to be a monograph: it is simply a contribution to our knowledge of these Lizards studied in relation to their distribution, a continuation of the excellent accounts given in similar manner by Bedriaga in the seventies of last century—with this difference, however, that the lepidosis is described with greater precision. It deals only with the western parts of Europe, including Italy, and with North Africa; the Lizards of Europe east of the Adriatic, and of South-western Asia, are at present being studied by Dr. Werner, Hr. Lehrs, and Prof. v. Méhely, and it is better to await the conclusion of their labours before preparing for publication the results of my examination of these Lizards, which I propose, however, to furnish ere long. When this is done, I hope to be able to summarise the whole subject in a strictly systematic order.

In order to ensure absolute accuracy, the figures illustrating this paper are reproductions of photographs, on which great pains have been bestowed by my excellent artist, Mr. J. Green. The coloured Plates have, of course, been prepared from living specimens.

I.—CENTRAL EUROPE.

(Plates XXIV. & XXV.)

All the specimens from which the following description is drawn up belong to what may be called the typical form in its narrowest sense, the species *Lacerta muralis* having been established by Laurenti¹ upon specimens from the vicinity of Vienna, where, as is well ascertained², no definable varieties occur. In order to have before me "topotypes" of the species, I applied to my friend Dr. Werner, who, with his usual kindness, at once sent me two specimens, a male and a female. Very curiously, the latter turns out to be the most aberrant example, so far as the scaling is concerned, which I have found among the hundreds of specimens examined by me from France, Belgium, Western Germany, Switzerland, and various parts of Austro-Hungary, and

¹ Syn. Rept. p. 61, pl. i. fig. 4 (1768).—*Seps muralis*.

² Werner, Rept. u. Amph. Oesterr. Ung. p. 40 (1897).

adds considerably to the ascertained amplitude of variation in the number of dorsal scales and femoral pores. However much all these specimens vary in scaling and coloration, I feel satisfied that further subdivision into local varieties is unfeasible, and that even insular forms such as have been named by R. Blanchard¹ are not capable of definition.

Form and Proportions.

Head about once and a half or once and three-fifths as long as broad, more or less depressed, its depth, in the tympanic region, equal to the distance between the anterior corner, the centre, or the posterior corner of the eye and the anterior border of the tympanum; snout obtusely pointed. Neck as broad as the head, or slightly constricted. Body rather strongly depressed. Hind limb, in the males, reaching the axil, the shoulder, or the collar; in the females, reaching the wrist or the elbow of the fore limb laid against the body; foot once and one-tenth to once and one-third the length of the head, rarely (in males) not longer than the head.

Tail cylindrical or cyclotetragonal, often slightly flattened at the root, once and two-thirds to twice and one-sixth the length of head and body.

Scaling.

Nostril (text-fig. 1) pierced between nasal, postnasal, and first upper labial; exceptions, in which the rostral enters the nostril, are extremely rare². Nasals usually forming a

Text-fig. 1.



End of snout in two male specimens of *Lacerta muralis* from the Bies Glacier, near Randa, Switzerland.

median suture, variable in extent; rostral rarely in contact with frontonasal³; latter sometimes in contact with frontal⁴; an azygous shield sometimes separates the præfrontals (Pl. XXV. fig. 2); frontal usually as long as its distance from end of snout, often a

¹ Mém. Soc. Zool. France, iv. 1891, p. 502.

² One specimen from Fontainebleau (Lataste Coll.), and one from the Bies Glacier, near Randa, Switzerland (altitude 6500 feet).

³ Four specimens from Eaux-Bonnes, Pyrenees; 3 (out of 4) from near St. Malo (Pl. XXV. fig. 3); 2 from near Dinant, Belgium; single specimens from Paris, Bordeaux, Fontainebleau, Glenan Isles, and Bazias (S. Hungary).

⁴ Single examples from Bordeaux, Eaux-Bonnes, Glenan Isles, Herkulesbad, Bozen.

little shorter, sometimes a little longer, as long as or a little longer than the fronto-parietals¹; parietals once and one-fourth to once and a half as long as broad, usually in contact with the upper postocular², the outer border never distinctly concave for the reception of the supratemporal. A female specimen from Vöslau, near Vienna, is remarkable for the very regular division of each parietal into two by a transverse suture (Pl. XXV. fig. 4). Occipital usually shorter than, and as broad as or narrower than, the interparietal, but sometimes as long as the latter and not rarely broader³; a small additional shield not unfrequently intercalated between the two. A series of granules between the major (second and third) supraoculars and the supraciliaries; the first or the first and second supraciliaries usually in contact with the second supraocular (Pl. XXV. fig. 1), but the series of granules sometimes complete, extending from the first supraocular to the upper postocular.

The specimen from near Vienna, noticed above as having the parietal shield divided, is further anomalous in the total absence of the first supraocular (Pl. XXV. fig. 4). Postnasal single⁴; nasal usually separated from the anterior loreal by the postnasal⁵. Temporal scales small, often granular; masseteric disk and tympanic shield nearly always present⁶; masseteric disk usually large, round or oval, and separated from the parietal by a supratemporal shield or one or two, rarely three, series of scales. Four upper labials anterior to the subocular, very rarely three or five, and on one side only; subocular very variable in shape⁷. 20 to 30 scales and granules in a straight line between the symphysis of the chin-shields and the median collar-plate; gular fold usually distinct, indicated by one, two, or three series of minute granules. Collar without, or with merely a trace of, serration, composed of 7 to 12 plates, usually 9 to 11 (not including the outer, smaller plates which are separated from the edge by granules).

Scales on body granular, juxtaposed, round or oval-subhexagonal, more or less distinctly keeled, rarely smooth⁸, often a little larger on the back than on the

¹ Shortest frontal, measuring only three-fifths its distance from end of snout, in a male from St. Malo (Pl. XXV. fig. 3).

² Exceptions in three specimens from Glenan Isles and in three from Eaux-Bonnes. I must here correct a *lapsus* in my description of *Lacerta depressa* (P. Z. S. 1904, ii. p. 333) where "upper supraocular" should read "upper postocular."

³ Occipital very minute, almost reduced to a granule, in one specimen from Dinant.

⁴ Absent, fused with the anterior loreal, in a specimen from St. Malo; divided into two in a female from Paris (Lataste Collection).

⁵ Exceptions, in which the nasal joins the anterior loreal above the postnasal, are not at all unfrequent; I have noticed them in specimens from St. Malo, Glenan Isles, Eaux-Bonnes, Odilienberg, and Randa.

⁶ Absent in a specimen from St. Malo and in one from Eaux-Bonnes.

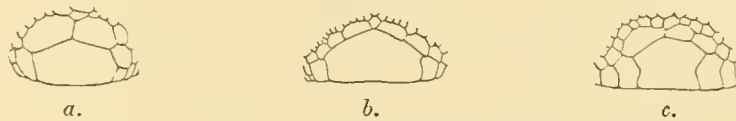
⁷ Its lower border sometimes as long as its upper border, a character which has been given as diagnostic of *L. depressa*.

⁸ In two specimens from Dinant, Belgium.

sides; 42 to 62 scales across the middle of the body, usually 47 to 59¹; 3 or 4, rarely 2 or 3² or 4 or 5³ transverse series correspond to one ventral plate, 29 to 45 to the length of the head.

Ventral plates in 6 longitudinal and 23 to 32 transverse series; the plates of the two median series as broad as or narrower than those next to them.

Text-fig. 2.

Præanal region of *Lacerta muralis*.

a. ♀, Eaux-Bonnes. b. ♂, Eaux-Bonnes. c. ♂, St. Malo.

Præanal plate (text-fig. 2) very variable, but usually large, bordered by one semicircle of small plates, often with an outer semicircle of smaller plates or scales. Scales on the upper surface of the tibia granular, more or less distinctly keeled, usually smaller than those on the back, rarely nearly as large. 22 to 28 lamellar scales under the fourth toe.

Femoral pores from 13 to 25 on each side, usually 16 to 21⁴. Caudal scales (in the basal fourth) usually narrow, truncate or more or less obtusely pointed, the upper more or less strongly keeled, the lower smooth or feebly keeled; the whorls alternately longer and shorter, this feature more distinct in some specimens than in others; the fourth or fifth whorl behind the postanal granules contains 25 to 32 scales, exceptionally 20⁵.

Coloration.

Upper surface varying from grey to brown, sometimes with a tinge of greenish; two light, whitish, yellow, or greenish streaks or series of spots on each side, the upper from the outer edge of the parietal shield to the upper surface of the base of the tail, the lower from the upper lip, through the ear, to the groin (Pl. XXIV. figs. 3 & 4); between these two streaks, on each side, a black or dark brown band, which may be spotted with whitish, yellow, bluish, or greenish; the back often spotted or marbled with dark brown or black; frequently a dark brown or black vertebral stripe or series of more or less confluent spots. Some specimens, especially males, entirely marbled

¹ The minimum (42) occurs in a female from Vöslau, near Vienna, the maximum (62) in a female from Dinant (Pl. XXV. fig. 5).

² In a male from St. Malo and in a male from Fontainebleau.

³ In a male from Dinant, in a male from St. Malo, in a female from Eaux-Bonnes.

⁴ The minimum (13) occurs in a female specimen from Vöslau, near Vienna. I cannot agree with Werner (Zool. Jahrb., Syst. xiv. 1903, p. 333) when he says that the number of femoral pores increases with age. At least this is contrary to my experience in this lizard, quite young specimens from France and Germany having 16 to 19, as in adults.

⁵ Again in the aberrant specimen from Vöslau.

or reticulate with black, without or with mere traces of the light lateral streaks (Plate XXIV. fig. 1). Upper surface of head usually more or less dotted or spotted with black. Sometimes a well-defined black ocellus, with white or green centre, above the shoulder or axil¹.

Black and white spots on the sides of the tail, usually forming regular bars.

Lower parts white or yellow in females, white, pink, yellow, orange, or brick-red in males; blue spots on the outer row of ventral plates, especially in males; belly usually immaculate, or with scattered black dots in females, more or less spotted with black in males. In some specimens from Dinant, in Belgium (Plate XXIV. fig. 2), the black spots are confluent into longitudinal bands on the sides of the belly.

Young, just out of the egg, are dark grey above with round or vermicular lighter spots; a black vertebral line is often present; the two lateral streaks are usually very distinct and formed of more or less confluent white spots; the blackish band between them, continued from the temple, bears small round white spots; limbs blackish, spotted with white; lower parts white. (See text-fig. 4 *a*, p. 369, and text-fig. 6 *a*, p. 399.)

Measurements of adults (in millimetres):—

	1.	2.	3.	4.	5.	6.
From snout to vent	72	67	62	60	57	59
„ „ fore limb	28	22	25	21	24	21
Length of head	18	14	16	14	15	13
Width of head	12	9	11	9	9	9
Depth of head	9	7	8	7	7	7
Fore limb	23	20	23	19	20	18
Hind limb	35	30	35	30	30	26
Foot	20	17	19	16	17	14
Tail	102*	118	125	97	110	81*

* Tail reproduced.

1. ♂. Glenan Isles, Brittany (*Giard*).
2. ♀. „ „ „
3. ♂. Eaux-Bonnes, Pyrenees (*Lataste*).
4. ♀. „ „ „
5. ♂. Herkulesbad, Hungary (*Méhely*).
6. ♀. „ „ „

In the following table I give the size and record variations in the lepidosis in a number of adult specimens in the British Museum or in the Lataste Collection:—

	1.	2.	3.	4.	5.	6.	7.
Nr. St. Malo ♂	66	47	26	11	21	18	1
„ ♀	66	54	30	9	26	20	1
„ ♀	62	50	32	9	26	19	1
„ ♀	53	50	29	9	25	20-22	2

¹ Very well marked in some specimens from Paris, the Pyrenees, and the Alps near Randa.

		1.	2.	3.	4.	5.	6.	7.
Great Chausey Id.	♂	63	55	28	9	26	20-21	1
" "	♀	67	51	29	9	20	19	1
Glenan Isles	♂	72	53	25	9	22	18-19	1
" "	♀	67	47	29	9	22	18	1
Bouron, Fontainebleau . . .	♂	65	56	24	10	25	21-23	1
" "	♀	63	54	26	9	27	19	1
Eaux-Bonnes, Pyrenees . . .	♂	66	53	25	11	25	17-19	0
" "	"	64	54	27	11	27	17	1
" "	"	64	54	25	11	26	16-17	0
" "	"	54	55	25	9	26	21-20	1
" "	♀	65	48	29	11	21	16-18	2
" "	"	65	58	28	10	23	17	1
" "	"	59	51	29	9	23	18-19	0
" "	"	53	50	27	9	25	16	1
Dinant, Belgium	♂	60	54	25	9	21	18-20	1-2
" "	"	57	58	25	10	23	21-20	1
" "	"	54	55	25	9	23	21-20	1
" "	"	50	55	25	9	25	20	2
" "	♀	59	54	29	7	25	20-21	0
" "	"	56	62	27	9	24	21-18	1
" "	"	55	53	28	9	24	19-20	1
" "	"	55	59	29	9	24	21-20	1
Lower Ahr	♀	62	55	27	9	27	21-20	0
Odilienberg, Vosges	♂	64	48	26	8	20	18-20	1-2
" "	♀	58	55	27	11	22	19	1
Randa, Switzerland	♂	57	51	26	9	24	20-19	2
" "	"	56	52	26	9	27	20	2
Miesenbach, nr. Vienna . . .	♂	60	50	24	10	22	18-16	1
Vöslau, nr. Vienna	♀	56	42	28	9	22	13	1
Herkulesbad, Hungary . . .	♂	57	59	25	10	30	19-20	2
" "	♀	59	55	25	9	27	18-20	2
Bozen, S. Tyrol	♂	63	56	25	8	28	19-20	1-2
" "	"	62	56	26	12	26	21	1
" "	♀	67	57	30	10	28	21	1

1. Length (in millim.) from snout to vent. 2. Number of scales across middle of body. 3. Transverse series of ventral plates. 4. Number of plates in collar. 5. Number of scales and granules between symphysis of chin-shields and median collar-plate. 6. Number of femoral pores (on right and left sides, if differing). 7. Number of supraciliary shields in contact with second supraocular.

For detailed descriptions applying exclusively to the typical form, *cf.* Fatio, Faune des Vert. de la Suisse, iii. p. 92 (Switzerland); Lataste, Faune Herp. de la Gironde, p. 71 (Gironde); Bedriaga, Arch. f. Nat. 1878, p. 271 (W. Germany, Paris, Riviera, Tyrol).

Specimens from the Pyrenees at or near Eaux-Bonnes (700–1100 metres), of which I have examined over 50, are in no way distinguishable from the Wall-Lizard of the plains of France. But specimens from a greater altitude (1545 m.) in the neighbourhood of the Pic du Midi have been alluded to by Bedriaga (Arch. f. Nat. 1879, p. 290) as remarkable for their strongly depressed body and coarse dorsal scaling, and their general appearance when in the open had suggested *Lacerta vivipara* to their collector, F. Lataste. The dorsal scales are described as very flat, but with a more or less distinct keel; and, although the caudal scales are only feebly keeled, the whorls project on the sides to form a very distinct serration. The masseteric disk is usually broken up into 5 or 6 large scales. Dark ocelli are usually present above the axil.

From a brief allusion again made to these lizards by Bedriaga in his monograph Abh. Senck. Ges. xiv. 1886, p. 196), Méhely (Ann. Mus. Hung. ii. 1904, p. 371) is inclined to suspect the existence of a new species in the Pyrenees. As there is fortunately one of these specimens in the Lataste Collection, I can confidently say that a specific separation from *L. muralis* is out of question, and I append a few particulars of this unique example, a female, which is figured on Pl. XXIV. fig. 5 and Pl. XXV. fig. 6.

Head rather short and but moderately depressed, its greatest depth equalling the distance between the anterior border of the eye and the tympanum. Hind limb not quite reaching the wrist of the adpressed fore limb; foot not longer than the head.

Frontal shield a little shorter than its distance from the end of the snout¹; first supraciliary in contact with the second supraocular; occipital shorter, but a little broader, than the interparietal; nasal reaching or nearly reaching the anterior loreal; four anterior upper labials; masseteric disk very small on one side, indistinct on the other.

Only 19 gular scales and granules on the median line²; collar with entire edge, formed of 9 plates.

Dorsal scales granular, flat, rounded, faintly keeled, larger on the back than on the sides, where 3 correspond to a ventral plate; 50 scales across the middle of the body; 32 transverse series correspond to the length of the head. 28 transverse series of ventral plates.

Scales on upper surface of tibia feebly keeled, much smaller than on the back (8 rows of these scales corresponding to 5 dorsals).

Femoral pores 17–16. 24 lamellar scales under the fourth toe.

Caudal scales truncate and rather feebly keeled, the whorls very distinctly longer and shorter alternately and detached at the sides, forming a strongly serrated outline; 24 scales in the fourth whorl.

Brown above, with two white, black-edged streaks on each side, and a vertebral series

¹ Quite in the same proportion as in Méhely's *Lacerta horvathi*.

² Just below the minimum recorded in the typical form from other localities.

of partly confluent black spots; two black ocelli with white centres above the shoulder; only very small spots on the sides of the tail; belly greyish white, with small black spots on the sides.

	millim.
From snout to vent	70
„ „ fore limb	24
Length of head	15
Width of head	10
Depth of head	8
Fore limb	20
Hind limb	27
Foot	15
Tail (reproduced)	108

In the same part of the Pyrenees, but at a much lower altitude, I captured in June 1878, on a wall in the town of Bagnères de Bigorre, a rather remarkable specimen, preserved in the Brussels Museum, which my colleague M. Dollo has had the kindness to send me for re-examination. It is a female of large size (72 millim. from snout to vent), which attracted my attention by the presence of a large black ocellus with blue centre, above the axil, well displayed as the lizard sunned itself on the old wall.

Head once and two-fifths as long as broad, much depressed¹, its depth equal to the distance between the posterior border of the eye and the tympanum. Hind limb reaching the elbow of the adpressed fore limb; foot once and one-fourth as long as the head. Frontal shield nearly as long as its distance from the end of the snout; series of supraciliary granules complete; occipital much smaller than the interparietal; masseteric disk rather small. 21 gular scales and granules on the median line; collar with entire edge, formed of 10 plates. Dorsal scales granular, flat, smooth, faintly keeled towards the tail, a little larger on the back than on the sides, where 3 correspond to a ventral plate; 55 scales across the middle of the body; 28 transverse series correspond to the length of the head. 29 transverse series of ventral plates. Scales on upper surface of tibia distinctly keeled, smaller than dorsals. Femoral pores 17 on each side. 26 lamellar scales under the fourth toe. Caudal scales obtusely keeled, very obtusely pointed behind; the fourth whorl behind the postanal granules contains 36 scales. Colour grey-brown above, with a dark brown lateral band bordered above and below by a white streak; a few blackish dots irregularly scattered on the back; above the axil, the lateral band is interrupted by the large ocellar spot mentioned above; belly without spots.

A side view of the head and anterior part of the body of this specimen (enlarged $2\frac{1}{2}$ times) is given on Pl. XXV. fig. 7.

¹ Quite as much as in a typical *L. depressa*.

II.—SPANISH PENINSULA.

(Plates XXIV. & XXV.)

The typical form, in no respect distinguishable from that inhabiting Central Europe, certainly occurs in the northern parts. The British Museum contains specimens from Corunna (Seoane) and from Barcelona (Thomas and Pocock). Specimens from Arnao (Bedriaga) are in the Lataste Collection ¹.

The belly of the adult males is spotted with black, and the masseteric plate is well developed, except in one specimen from Barcelona, in which it is altogether absent.

Larger, more handsomely marked specimens occur on the islet La Deva, opposite Arnao, and have been described by Bedriaga as

Var. *RASQUINETH*, Arch. f. Naturg. 1878, p. 260, pl. x. figs. 1 & 2.

Dark olive-green to dark brown above; sides of body sky-blue with a black network; a series of black spots forms an interrupted stripe along the middle of the back; large black spots on the upper surface of the tail; lower parts bright red, much spotted with black; the whole of the outer row of ventral shields and the outer half of the adjacent ventral shields sky-blue.

The type specimen, male, of which the life-coloration has been described and figured by Bedriaga, is now preserved in the British Museum.

Dimensions (in millimetres) and scaling are as follows:—

From snout to vent	70
„ „ fore limb	28
Length of head	18
Width of head	12
Depth of head	10
Fore limb	24
Hind limb	36
Foot	19
Tail (reproduced)	113
Number of scales across body	58
„ „ corresponding to a ventral plate	3-4
„ „ from chin-shields to collar	25
„ plates in collar	9
„ transverse rows of ventral plates	26
„ femoral pores	17-18

Dorsal scales very distinctly, rather strongly keeled, the keels disappearing on the sides of the body; 38 transverse series correspond to the length of the head. Edge of

¹ Specimens from Arnao have been described from life by Bedriaga, Arch. f. Naturg. 1878, p. 267.

collar very slightly serrated. Temporal scales rather large, with quite distinct tympanic and masseteric shields, the latter separated from the parietal by two series of scales. The rostral shield very nearly enters the nostril. 25 scales under the fourth toe.

In my opinion, Rasquinet's lizard does not constitute a definable variety, any more than the lizards on the Glenan Isles in Brittany, and I regard it as almost certain that were any large number of specimens collected some would prove to be absolutely unseparable from the typical form as occurring on the mainland of the Asturias.

In North-western and Central Spain and in Portugal there occurs a distinct form which has been insufficiently defined by Seoane as

Var. BOCAGEI,

in a pamphlet issued in 1885 (antedated 1884) under the title of "*Identidad de Lacerta Schreiberi* (Bedriaga) y *Lacerta viridis*, var. *Gadowii* (Boulenger) í investigaciones herpetológicas de Galicia."

"*Lacerta muralis*, Laur., var. *Bocagei*, nov. var. Comunísimo en toda Galicia. Esta forma, intermedia entre *muralis fusca* y *muralis pytiusensis*, se diferencia de la primera por el dorso que es de color verde, y de la segunda por que los flancos son pardos, además de los caracteres que espondré al describirla."

I here give details of specimens from Galicia, received from the late V. L. Seoane and preserved in the British Museum and in the Lataste Collection, from Madrid, received from the Madrid Museum, and from the Serra de Gerez, collected by Dr. Gadow. Specimens from Pontevedra (Boscá) are in the Lataste Collection.

			1.	2.	3.	4.	5.	6.
♂.	Galicia		57	60	29	9	29	16-15
"	"		45	54	27	11	23	18-17
"	"		42	55	27	10	24	16-15
♀.	"		60	57	29	8	25	16
"	"		55	62	30	10	27	17
♀.	Corunna		44	58	32	11	25	15
♂.	Escorial, Madrid		56	65	26	11	30	19
"	"	"	56	62	27	11	27	19-20
♀.	"	"	59	56	29	10	29	17-16
♂.	S. de Gerez		55	58	26	9	26	17
"	"		55	54	26	9	28	19-18
"	"		55	57	28	11	26	17
"	"		55	63	28	9	31	15

1. Length (in millim.) from snout to vent. 2. Number of scales across middle of body. 3. Transverse series of ventral plates. 4. Number of plates in collar. 5. Number of scales and granules between symphysis of chin-shields and median collar-plate. 6. Number of femoral pores.

The dorsal scales are sometimes distinctly keeled, sometimes quite smooth; 36 to 50 transverse series correspond to the length of the head; the ventrals form 6 longitudinal series. 28 to 34 caudal scales in the 4th or 5th whorl behind the postanal granules, those on the upper surface strongly keeled. 21 to 29 scales under the fourth toe. The head (Pl. XXV. figs. 8 & 9) is often rather more depressed than in the Central-European specimens, and may remind one of *L. bedriagæ* from Corsica; its depth at the occiput equals in some specimens the distance between the tympanum and the posterior border of the eye, in others that between the tympanum and the centre of the eye.

Out of 5 specimens from the Serra de Gerez, 2 have the parietal excluded from contact with the postocular¹.

The masseteric disk is often very small or absent. The markings vary much, but there is never any indication of a dark vertebral stripe; the light dorso-lateral streaks, if present, are closer together, or at any rate not wider apart, on the body than on the nape; the sides, and often the whole of the body, may show a black network enclosing small roundish pale green spots; the lower parts are uniform, or but scantily spotted with black.

Young specimens from Oporto (Gadow) and Cintra (Yerbury) may be referred to the same variety.

Two specimens, male and female, from Galicia, collected by M. Seoane, are figured, Pl. XXIV. figs. 6 & 7, and the anterior part of the body of a spotted male from the Serra de Gerez, collected by Dr. Gadow, is represented on Pl. XXIV. fig. 8.

Specimens from Lisbon agree with those from Galicia, except that the caudal scales are less strongly keeled. The scales are smooth or nearly so, and the masseteric disk is small or absent.

		1.	2.	3.	4.	5.	6.
♂.	Lisbon	48	60	26	9	29	21
♀.	„	48	60	30	9	23	16-18
♀.	„	46	55	30	10	29	19-18

Boettger (Sitzb. Akad. Berl. 1887, p. 185) also finds the Lisbon and Gerez specimens very similar, and describes the ground-colour as of a greenish grey.

Specimens from Coimbra have been described by Bedriaga in 1890 ('Amphibiens et Reptiles recueillis en Portugal par M. A. F. Moller,' p. 52). The femoral pores are stated to vary between 15 and 19. Unlike the Portuguese specimens examined by me, the tail does not equal two-thirds of the total, and the scales on the upper surface of the leg may be as large as those on the body.

¹ A young lizard from Ciudad Real (Boscá) in the Lataste Collection, which agrees well with the Serra de Gerez specimens, also shows this character.

Measurements of specimens from N.W. Spain and Portugal:—

	1.	2.	3.	4.	5.	6.
From snout to vent	57	55	55	55	48	46
„ „ fore limb	22	19	21	21	18	17
Length of head	14	12	14	13	11	10
Width of head	10	8	9	9	8	7
Depth of head	8	7	7	6	6½	5½
Fore limb	20	17	20	18	16	14
Hind limb	30	24	30	27	26	21
Tail	85	92	103	93	102	60

1. ♂. Galicia (*Seoane*.—*Lataste Coll.*).

2. ♀. „ „

3. ♂. Serra de Gerez (*Gadow*).

4. ♂. „ „

5. ♂. Lisbon (*H. O. Forbes*).

6. ♀. „ „ Tail reproduced.

Var. LIOLEPIS.

Bedriaga (*Arch. f. Naturg.* 1879, p. 292) has briefly alluded to a small form which he observed alive at Valencia, on the road to the Dehesa de la Albufera, and which struck him as remarkable for the extremely small dorsal scales and smooth caudal scales, the middle dorsals of which are more or less enlarged. The colour is described as a pale yellowish brown above, with a brown, white-edged lateral band, greyish or yellowish beneath. Length from snout to vent 49 millimetres.

Among numerous specimens from Valencia in the British Museum (Lilford, Boscá, Bolivar) some agree with Bedriaga's description in having the upper caudal scales very faintly keeled, almost smooth, and the granular dorsal scales are very minute, scarcely larger than those on the upper surface of the tibia. Some specimens, however, have the dorsal scales larger, and the caudal scales distinctly, though rather feebly, keeled; I do not think it possible to sharply define this form, which may be said to connect the typical form with the var. *hispanica*, and also with the var. *pityusenis*. I have received specimens of the same form from Seville (Prof. Calderon).

The scales across the body vary from 52 to 65; 3 or 4 correspond to one ventral plate, and 42 to 56 to the length of the head; they are smooth or faintly keeled on the back; ventral plates in 6 longitudinal rows, except in one ♀, which has 8; collar-plates usually smaller than in the typical form, 9 to 14 in number; 25 to 35 gular scales and granules on the median line. Upper caudal scales feebly or faintly keeled, sometimes nearly smooth; 28 to 34 scales in the 4th or 5th whorl behind the postanal granules. Femoral pores 15 to 22 on each side. 23 to 27 scales under the fourth toe. Nearly constantly four anterior upper labials¹. Masseteric disk more or less

¹ One specimen has five on one side.

developed (separated from the parietal by 1 to 4 series of scales) in 10 specimens out of 30, this plate in the others being just distinguishable or absent. In one specimen from Seville the parietal is not in contact with the postocular.

No specimen exceeds a length of 60 millim. from snout to vent, and females of 44 millim. are gravid.

In their markings the very young (see text-fig. 4 *c*, p. 369) are quite similar to those of the typical form from France, and a black vertebral streak (which I have never observed in any of the specimens from North-Western and Central Spain and Portugal) is likewise often present. The adults are pale grey or brown, and the blackish spots, if present, are small; a median series of black spots or traces of a blackish vertebral line are often present; ventral spots are absent or small and confined to the sides. One male specimen from Valencia is exceptional in having the lower parts dotted all over with black.

I append particulars of 12 specimens from Valencia, and of 2 from Seville.

		1.	2.	3.	4.	5.	6.
Valencia	 ♂	60	57	27	10	33	18
„	 „	60	55	26	12	28	17-16
„	 „	55	62	28	14	34	20
„	 „	53	58	25	10	28	16
„	 „	52	59	27	12	29	18-21
„	 „	51	59	28	11	28	18-19
„	 „	49	64	23	10	27	18
„	 ♀	54	59	30	11	25	17
„	 „	50	60	31	11	30	16-17
„	 „	50	62	30	11	33	17-18
„	 „	46	53	28	11	28	16
„	 „	44	59	30	12	27	18-19
Seville	 ♂	52	62	28	11	26	19-20
„	 ♀	50	57	29	11	28	19

Measurements of largest male and female from Valencia:—

	♂.	♀.
From snout to vent	60	54
„ „ fore limb	24	19
Length of head	15	12
Width of head	10	8
Depth of head	8	6
Fore limb	20	17
Hind limb	33	26
Foot	17	13
Tail	120	60 *

* Reproduced.

Male and female specimens from Valencia are figured on Pl. XXIV. figs. 9 & 10, and Pl. XXV. fig. 10.

Var. VAUCHERI.

A single male specimen of a lizard agreeing in most respects with the Tangier variety described further on as var. *vaucheri* was collected at Salir, Algarve, by Dr. Gadow, who has presented it to the British Museum. The dorsal scales are feebly keeled and not larger than those on the upper surface of the tibia; they number 76 across the middle of the body, 3 and 4 transverse series correspond to the length of one ventral plate, and 57 to the length of the head. The ventral plates form 27 transverse series, in most of which the outer plate is divided, so that the longitudinal rows may be described as 8 in number. 10 plates in the collar, and 31 gular scales and granules in a line in the middle. Femoral pores 18-17; 28 lamellar scales under the fourth toe. 30 scales in the fourth whorl behind the postanal granules. The specimen is anomalous in having only three anterior labials on the right side; the masseteric shield is small and divided into two or three pieces.

The back is greyish brown with a black network, the sides are black with round light spots; small black spots are present on the ventral shields.

	millim.
From end of snout to vent.	47
„ „ „ fore limb	19
Length of head	12
Width of head	8
Depth of head	6
Fore limb	16
Hind limb	26
Foot	15
Tail (reproduced).	73

Compared with the Tangier specimens on which this variety is primarily founded¹, the lizard here described differs in its still finer lepidosis and in the division of the outer ventral plates—characters which probably could not be maintained as distinctive should a series of specimens be available.

Var. MONTICOLA.

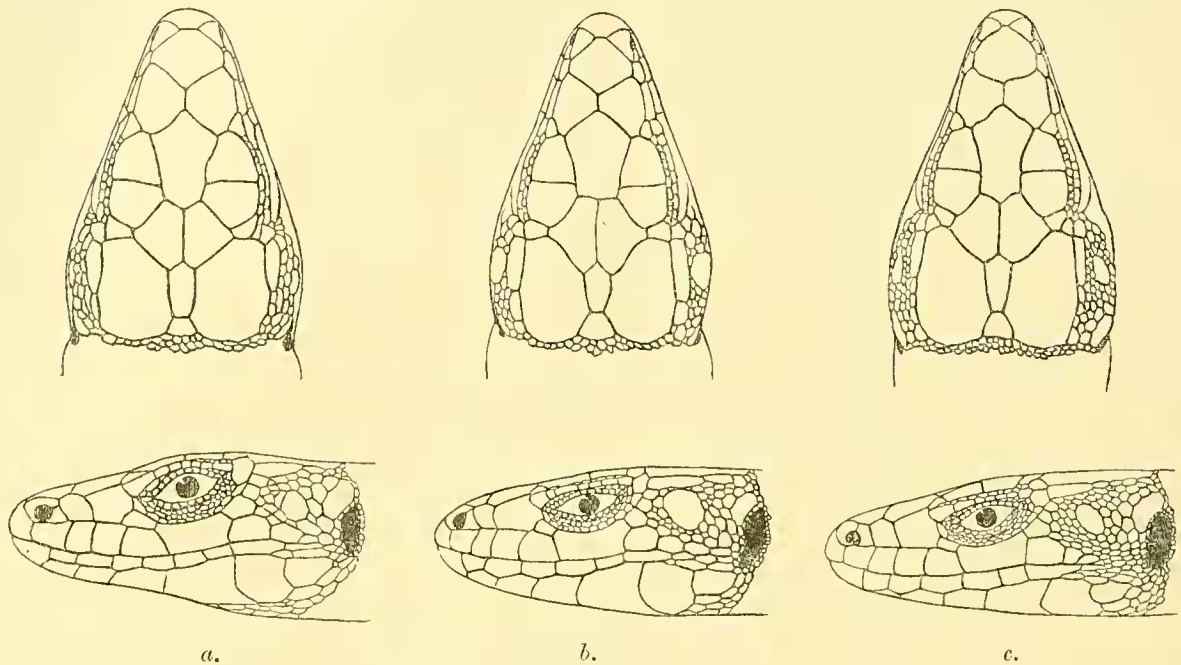
A single female specimen collected by Dr. Gadow in the Serra Estrella, Portugal, at an altitude of about 6000 feet (Pl. XXIV. fig. 11), first struck me by its general resemblance, in form and markings, to the Caucasian vars. *chalybdea* and *saxicola*. It has also much in common with the newly described *L. horvathi* from S.W. Hungary. Among the Lizards of the Madrid Museum, which Prof. Bolivar has kindly sent to me

¹ Below, p. 418, Pl. XXIX. fig. 9.

for study, I was pleased to find two further specimens of this form, both females—one marked “Galicia” (Pl. XXIV. fig. 12), the other from an unknown Spanish locality (Pl. XXIV. fig. 13). A young specimen labelled “Spain (Boscá)” is preserved in the Lataste Collection (see text-fig. 4 *d*, p. 369).

The head (Pl. XXV. figs. 11 & 12) is strongly depressed, and the supratemporals are well visible from above; the parietal does not touch, or scarcely touches, the upper postocular, and its antero-lateral border is slightly concave¹; in one specimen the nasal

Text-fig. 3.



Upper and side views of heads of :—*a.* *Lacerta horvathi*; *b.* *L. muralis*, var. *monticola*; *c.* *L. muralis*, var. *depressa*.

forms a suture with the loreal²; four anterior upper labials; masseteric disk large; rostral forming a suture with the frontonasal; frontal as long as or a little shorter than its distance from the end of the snout; supraocular granules forming a complete series.

¹ Exactly as figured for *L. mosoriensis* by Méhely, Ann. Mus. Hung. ii. p. 366, fig. 2, A.—“Diese Eigenschaft, die ich für einen blutsverwandtschaftlichen Character einer mit *Lacerta saxicola* Eversm. im Kaukasus beginnenden und mit *Lacerta horvathi* abschliessenden, von der Entwicklungsreihe der *Lacerta muralis* grundverschiedenen phyletischen Reihe betrachte.”—Méhely, *l. c.*

² As in *L. horvathi*, Méhely, *l. c.* p. 367, fig. 3, C.

22 to 25 transverse series of gular scales; collar entire, with 9 or 10 plates. Dorsal scales (Pl. XXV. fig. 13) large and flat, smooth or faintly keeled, larger than those on the sides, which are larger than those on the upper surface of the tibia, 5 or 6 of the former corresponding to 8 of the latter; 46 to 50 scales across the middle of the body, 27 to 34 transverse series corresponding to the length of the head¹. Ventral plates in 28 or 29 transverse series, some of which may contain 8 plates. Femoral pores 17 to 20. 23 or 24 lamellar scales under the fourth toe. 28 to 30 caudal scales in the front whorl behind the postanal granules, the upper truncate and very feebly keeled; the whorls very markedly longer and shorter alternately. The hind limb reaches the wrist or the elbow of the adpressed fore limb.

The following are the particulars of the three female specimens:—

	1.	2.	3.	4.	5.	6.
Spain	76	50	28	10	25	18-17
Serra Estrella	62	47	29	9	25	19-20
Galicía	62	46	28	9	22	17

Greyish or pale olive above (in spirit), with large black spots forming two series along the middle of the back; sides darker, bordered above by a series of black spots or by a black wavy streak enclosing light round spots; a few dark ocelli with light centres may be present above the shoulder and axilla; lower parts whitish or greyish, with or without scattered black dots on the belly and under the hind limbs.

Measurements (in millimetres):—

From snout to vent	76	62	62
„ „ fore limb	27	22	24
Length of head	16	15	15
Width of head	11	10	10
Depth of head	7	6	7
Fore limb	22	20	21
Hind limb	35	31	31
Foot	17	17	17

Figures are given on page 366 of the upper aspect of the head of the largest female specimen from Spain, in one of the types of *L. horvathi* Méhely, and that of a

¹ These scales are strikingly similar to those of *L. horvathi*, which, according to Méhely, number 40 to 46 across the middle of the body. In a specimen which Prof. v. Méhely has kindly sent me, the scales number 43 across the middle of the body, and 31 transverse series of dorsal scales correspond to the length of the head: the Professor kindly informs me that the statement made by him that 10 to 12 transverse series of dorsal scales correspond to the length of one centimetre is the result of a *lapsus*, 18 to 22 being the right number. The scales are represented as much too large in the figure of *L. horvathi* given in the Hungarian journal 'Allattani Közlemények,' iii. 1904, pl. v.

male from Trebizond, one of the types of *L. depressa* Camerano¹, in order to show the striking resemblance in the form of the head-shields in these geographically remote varieties.

A very distinct variety, which is, however, connected with the var. *liolepis*, is that first described by Dr. Steindachner as a form of *Lacerta oxycephala*, and for which the name *hispanica*, proposed by him, should be retained. Its synonymy is as follows:—

Var. HISPANICA.

Lacerta oxycephala, var. *hispanica* Steindachner, Sitzb. Ak. Wien, lxii. 1870, 1, p. 336, pl. i. figs. 3–6; Boettger, Abh. Senck. Ges. xii. 1881, p. 376.

Lacerta oxycephala, part., Schreiber, Herp. Eur. p. 404 (1875).

Lacerta muralis fusca, part., Bedriaga, Arch. f. Nat. 1879, p. 293.

Lacerta muralis, subsp. *steindachneri* Bedriaga, Abh. Senck. Ges. xiv. 1886, p. 256.

Lacerta muralis, var. *hispanica* Boulenger, Cat. Liz. iii. p. 33 (1887).

This form, which in its sharply pointed snout and conspicuously striated body reminds one of a young *Acanthodactylus*, has been very well figured by Steindachner and fully described by Bedriaga. Its characters have been summarised by me as follows:—

Head and body much depressed; snout moderately long, acutely pointed. Frequently five upper labials anterior to the subocular; no masseteric shield. Collar-plates very small; gular fold scarcely indicated. Scales small, flat, smooth, roundish, 50 to 60 across the middle of the body. Grey above, with five or seven longitudinal blackish streaks usually bearing small irregular light spots; the lateral streak, passing through the eye, broadest, the vertebral narrowest; in the young, the lateral black streaks separated by pure white ones; lower surfaces uniform whitish.

I have nothing to modify in this definition, as the British Museum has only added one to the two small specimens mentioned in the Catalogue.

The femoral pores number 15 to 19 (14–18, Bedriaga). The series of supraocular granules is complete or the first supraciliary is in contact with the second supraocular; one specimen has 5 anterior upper labials on both sides, a second has 5 on one side and 4 on the other, whilst a third has 4 on both sides; the parietal does not touch, or barely touches, the upper postocular; gular scales in 26 to 29 transverse series. Upper caudal scales feebly keeled. 25 or 26 scales under the fourth toe. The hind limb reaches the axilla or the shoulder.

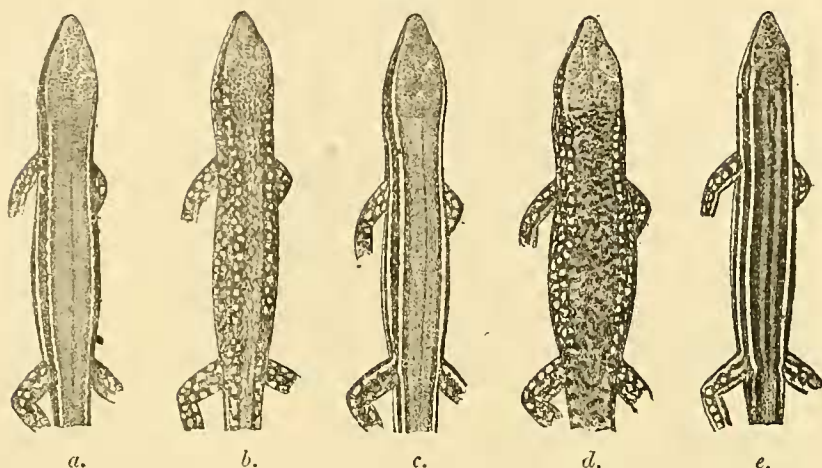
This lizard does not appear to exceed a length of 50 millim. from snout to vent.

Figured on Pl. XXIV. fig. 14 and Pl. XXV. figs. 14 & 15.

Habitat. S.E. Spain (Alicante, Murcia, Cartagena, Almeria).

¹ Cf. Boulenger, P. Z. S. 1904, ii. p. 332, pl. xxii. fig. a.

Text-fig. 4.



Young specimens of :—*a*, f. *typica*, Arnao, Asturias ; *b*, var. *bocagei*, Madrid ; *c*, var. *liolepis*, Valencia ; *d*, var. *monticola*, Spain ; *e*, var. *hispanica*, Almeria.

III.—BALEARIC ISLANDS.

(Plates XXIII. & XXVI.)

A good example of the neglect of the lepidosis in defining races of the Wall-Lizard, of which I have complained above, is offered by the lizards inhabiting the Balearic Islands. Although the form and coloration have been described by Bedriaga and by Boscá, the difference in scaling by which the Iviza lizard can be sharply separated from the so-called varieties inhabiting the two more eastward islands has hitherto entirely escaped attention. Yet, with the help of these characters, the Balearic lizards stand out as the best-definable of all the subspecies or varieties which have been included under *Lacerta muralis*, and certainly have stronger claims to specific separation than have *L. bedriagæ* and *L. depressa*.

But, then, it is necessary to entirely put aside the colour—whether brown, yellow, green, or black—and to place together, as var. *pityusensis* Boscá, the Iviza specimens referred by Boscá to vars. *balearica* and *pityusensis*, and to group under the older name of var. *lilfordi* Gthr. all the lizards from Majorca, Minorca, and neighbouring islands, which have been described by Bedriaga as vars. *balearica*, *gigliolii*, and *lilfordi*, the numbers of the scales counted across the middle of the body (55 to 68 in the former, 70 to 90 in the latter) being sufficient for their discrimination. The important fact that in the Iviza lizards the rostral shield constantly enters the nostril, as only exceptionally happens in other forms of *L. muralis*, affords a diagnostic character by which to separate them from those of Spain, which agree in the number of scales across the body.

Since this paper was written Hr. Lorenz Müller has reported (Zool. Anz. 1905, p. 502) the occurrence of the var. *cettii* (= *tiliguerta*) at Binisaida, S.E. coast of Minorca, and he has kindly sent me one of his specimens, which agrees entirely with the Sardinian var. *tiliguerta*. Whether these lizards are really indigenous or were introduced by human agency is a question which Hr. Müller himself has suggested for consideration, but which cannot at present be solved.

Var. PITYUSENSIS.

Lacerta muralis, var. *balearica* Boscá, An. Soc. Espan. H. N. xii. 1883, p. 245.

Lacerta muralis, var. *pityusensis* Boscá, l. c. p. 246.

Lacerta muralis balearica, var. *pityusensis* Bedriaga, Abh. Senck. Ges. xiv. 1886, p. 254.

Head (Pl. XXVI. fig. 1 *a*) once and a half to once and two-thirds as long as broad, moderately depressed, its depth in the tympanic region equalling the distance between the anterior border or the centre of the eye and the anterior border of the tympanum; snout rather pointed. Neck as broad as or a little broader than the head. Body moderately depressed. Hind limb reaching the shoulder or the collar in the males, the shoulder, the axil, or the elbow of the adpressed fore limb in the females; foot as long as or a little longer than the head. Tail once and a half to a little over twice the length of head and body, rounded in section, cyclotetragonal at the base.

Rostral shield entering the nostril, often largely; nasals forming a suture behind the rostral, separated from the anterior loreal by the postnasal, which is usually single¹. Frontal as long as or shorter than its distance from the end of the snout; a series of granules between the supraciliaries and the principal supraoculars², the first or first and second of which are usually in contact with the first supraciliary. Occipital usually as long as and broader than the interparietal, sometimes much smaller. Parietals once and one-third to once and two-thirds as long as broad, in contact with the upper postocular. Upper temporal shield entirely absent or broken up into a series of small shields. Temple covered with granular scales; tympanic and masseteric shields distinct, the latter separated from the parietal by from one to three series of scales. Four upper labials anterior to the subocular³.

26 to 34 scales and granules on a line between the symphysis of the anterior chin-shields and the median collar-plate; gular fold distinct; collar even-edged, formed usually of rather small plates, 9 to 14 in number.

¹ Two postnasals on the left side in two of the specimens in the British Museum, two on both sides in a specimen in the Madrid Museum.

² These granules are reduced to a few in one of the specimens in the British Museum and in four in the Madrid Museum.

³ Five on one side in two specimens, on both sides in one.

Dorsal scales (Pl. XXVI. fig. 1 *b*) granular, roundish-hexagonal, more or less feebly but always distinctly keeled, 55 to 68 across the middle of the body; 3 and 4 transverse series (rarely 4 throughout) correspond to one ventral plate, 35 to 47 to the length of the head.

Ventral plates in 6 longitudinal and from 26 to 30 transverse series.

Anal plate bordered by one or two semicircles of small plates.

Scales on upper surface of tibia finely granular, much smaller than dorsals, more or less distinctly keeled. 19 to 24 pores under each thigh. 26 to 31 lamellar scales under the fourth toe.

Upper caudal scales strongly keeled, truncate or very obtusely pointed behind; the whorls subequal in length, the fourth behind the postanal granules containing 30 to 38 scales.

Brown, yellow, or green above, with black or reddish-brown spots or vermiculations, usually arranged in five or seven more or less well-defined longitudinal stripes; the black markings sometimes forming chains enclosing roundish light spots, or an irregular reticulate pattern, or reduced to mere dots or vermiculations; females often with a light dorso-lateral streak, beginning from the supraciliary edge, sometimes bordered by fine black lines, sometimes with a black vertebral streak; upper surface of head spotted or vermiculated with black; tail with dark and light markings, forming more or less regular longitudinal series. Young with six light streaks on the body. Belly yellow, orange, or red, without markings, except on the outer row of ventral plates, which bears large blue spots.

Measurements (in millimetres) of two of the type specimens in the Lataste Collection :—

	♂.	♀.
From snout to vent	72	64
„ „ fore limb	30	23
Length of head	18	15
Width of head	13	9
Depth of head	11	7
Fore limb	28	19
Hind limb	40	32
Foot	21	17
Tail	145	85 *

* Tail reproduced.

I have examined 79 specimens, all collected by Sr. E. Boscá on Iviza, three of which belong to the Lataste Collection, the rest being in the British and Madrid Museums.

I append particulars as to size and scaling of some of them:—

	1.	2.	3.	4.	5.	6.
♂	80	60	26	12	30	21
„	75	61	27	10	31	23-21
„	73	67	27	14	34	24-22
„	72	62	28	9	30	22-24
„	72	60	27	12	28	22-23
„	70	63	26	12	26	20
„	67	60	26	12	28	19-20
„	65	63	27	11	31	21
„	64	62	28	10	32	23
„	62	68	27	11	32	23
„	60	64	27	11	29	23-24
♀	70	60	30	9	26	19
„	64	55	29	9	29	20-21
„	62	57	28	11	33	22-21
„	58	57	29	10	33	20-21
„	55	56	28	10	31	23-22

1. Length (in millim.) from snout to vent. 2. Number of scales across middle of body. 3. Transverse series of ventral plates. 4. Number of plates in collar. 5. Number of scales and granules between symphysis of chin-shields and median collar-plates. 6. Number of femoral pores (on right and left sides, if differing).

This form was found by Boscá on Iviza and on the small neighbouring islands La Grosa, La Redonia, and El Malvi.

Several specimens are figured on Pl. XXVI. figs. 1-5.

Var. LILFORDI.

Zootoca lilfordi Günther, Ann. & Mag. N. H. (4) xiv. 1874, p. 158.

Lacerta lilfordi Braun, Arb. Zool. Inst. Würzb. iv. 1877, p. 4.

Lacerta muralis Braun, l. c. p. 26.

Lacerta muralis fusca Bedriaga, Arch. f. Naturg. 1878, p. 275.

Lacerta muralis, var. *gigliolii* Bedriaga, op. cit. 1879, p. 247, pl. xvii. fig. 2.

Lacerta muralis, vars. *balearica*, *gigliolii*, *lilfordi* Bedriaga, Bull. Soc. Zool. France, 1879, p. 221, pl. ix. figs. 1-3.

Lacerta muralis balearica, part., Bedriaga, Abh. Senck. Ges. xiv. 1886, p. 248.

Variations in colour in this lizard are solely responsible for the several names in the above given synonymy. The black colour of the specimens from the Isla del Ayre, near Minorca, was the sole ground on which Günther established his *Zootoca lilfordi*, and he showed his neglect of structural characters by associating with it the black lizard of the Filfolá rock near Malta. The lizard of Isla del Ayre differs, I repeat, in no other

respect but the ground-colour from the brown or green lizards of Minorca and Majorca, the markings of which may be detected in certain lights in some adult black specimens, and which are distinctly shown by all young specimens. Brown and olive-green specimens from Minorca were first referred by Bedriaga to his subspecies *fusca*, and afterwards to a distinct variety named *balearica*; whilst specimens with a blue or blue-green back, from the Dragoneras Island, near Majorca, were described as another variety named after Prof. Giglioli of Florence.

Having recently received from Señor J. Ferrer, of Mahon, numerous living specimens (some brown, some green, some bluish green on the back, and the green ones having after a time become brown ¹), I cannot regard the coloration as affording any justification for the establishment of varieties; and as the structural characters are the same in these so-called varieties, I have no hesitation in throwing them all together under the name of var. *lilfordi* Günther, which has priority over that of *balearica*. The form on which *L. lilfordi* was established I regard as a mere case of melanism, fixed on certain islands, through influences which are as yet unexplained; but there would, in my opinion, be no more reason for allowing it the rank of variety, in the sense in which I take the term, than in the case of the black individuals of *Vipera berus* and *V. aspis* or of *Lacerta vivipara*. Besides, if all the individuals on Ayre Island and other islets in the Balearic are affected with melanism, the name of the variety coupled with an indication of the locality is amply sufficient to avoid confusion with any other form. On the other hand, the Iviza lizard, which has been treated by previous authors as a race equivalent to the vars. *balearica*, *gigliolii*, and *lilfordi*, can be well defined and constitutes a quite distinct form.

Having explained my reasons for throwing together the so-called varieties mentioned in the synonymy, I will proceed to a description of the material before me, consisting of 32 specimens from the following localities:—Mahon (Braun in Lataste Coll., Bedriaga, Ferrer), I. del Rey, near Minorca (Braun in Lataste Coll., Ferrer), I. del Ayre, near Minorca (Lilford, Braun in Lataste Coll., Ferrer), I. Dragoneras, near Majorca (Bedriaga), I. la Guardia, near Majorca (Boscá). The specimens from Is. del Ayre and la Guardia are black or blackish, and represent the *L. lilfordi*, *sensu stricto*.

Head (Pl. XXVI. figs. 7 *a*, 7 *b*) once and a half to once and two-thirds as long as broad, moderately depressed, its depth in the tympanic region equalling the distance between the anterior border or the centre of the eye and the anterior border of the tympanum; snout usually decidedly pointed. Neck as broad as or broader than the head. Body moderately depressed. Hind limb reaching the shoulder, the collar, or a little beyond the latter in males, the axil or the shoulder in females; foot once to once and one-third the length of the head. Tail once and a half to once and four-fifths the length of head and body, rounded in section, cyclotetragonal at the base.

¹ As happens in the males of our Sand-Lizard, *Lacerta agilis*.

Rostral shield usually narrowly separated from the nostril, but sometimes entering it; nasals forming a suture behind the rostral, separated from the anterior loreal by the postnasal, which is single. Frontal as long as or shorter than its distance from the end of the snout; a series of granules between the supraciliaries and the principal supraciliaries, the first of which is often in contact with the first supraciliary. Occipital very variable in size, often longer and broader than the interparietal¹. Parietals once and one-third to once and two-thirds as long as broad, in contact with the upper postocular. Upper temporal shield entirely absent or broken up into a series of small shields. Temple covered with granular scales; tympanic and masseteric shields usually distinct², the latter separated from the parietal by two to four series of scales. Four upper labials anterior to the subocular.

30 to 40 scales and granules on a line between the symphysis of the anterior chin-shields and the median collar-plate; gular fold distinct; collar even-edged, formed usually of rather small plates, 9 to 15 in number.

Dorsal scales granular, round or oval, smooth, 70 to 90 across the middle of the body (Pl. XXVI. fig. 7 c); 4 and 5 transverse series (rarely 3 and 4) correspond to one ventral plate, 42 to 62 to the length of the head. Ventral plates in 6 longitudinal and 26 to 30 transverse series.

Anal plate bordered by one or two semicircles of small plates.

Scales on upper surface of tibia finely granular, smaller than dorsals, smooth; 17 to 25 pores under each thigh. 27 to 32 lamellar scales under the fourth toe.

Upper caudal scales more or less strongly keeled, truncate or very obtusely pointed behind; the whorls subequal in length, the fourth behind the postanal granules containing 30 to 46 scales.

The colour of the back varies from brown to olive, bright grass-green, or blue-green; the sides are brown or reddish brown with paler brown or pale green spots. Three stripes of dark brown or blackish spots or vermiculations extend along the back, but it frequently happens that these stripes lighten in the centre and that their borders become converted into lines, such specimens having six fine dark lines along the back; some specimens have dark marblings or vermiculations all over the back, and such is the case in the single very young specimen I have examined³. The lower parts vary from orange to salmon-red, copper-colour, or brick-red, without or with small black spots which may form regular longitudinal series; a series of turquoise-blue spots on each side of the belly; throat spotted or marbled with reddish brown or blackish.

In the specimen from Dragoneras Island, Minorca, named by Bedriaga var. *gigliolii*, the back, at least posteriorly, and the upper surface of the tail are described as of a dark blue-green or peacock-blue, and the outer row of ventral shields lapis-blue. Preserved

¹ Twice as long and twice as broad as the interparietal in a ♂ from Mahon.

² Hardly distinct in single specimens from Mahon, Dragoneras Island, and Ayre Island.

³ From Mahon, in the Lataste Collection.

in spirit, as they are now, such specimens cannot be distinguished from ordinary Minorca lizards.

The Ayre Island specimens are described by Günther (*Zootoca lilfordi*) as uniform deep shiny black above and of a beautiful sapphire-blue beneath. But some specimens from the same island sent to me alive by Sr. Ferrer are only of a very dark brown, with the dark markings (lines and spots) of the main island form perfectly distinguishable; pale bluish-green or turquoise-blue spots on the sides of the lapis-blue belly, which may bear small black spots. Now that they have been in spirit for many years, Lord Lilford's specimens also show very distinctly the dorsal markings. Some of the black specimens from La Guardia Island, near Majorca, collected by Señor E. Boscá, have numerous pale bluish-green spots on the sides of the body and on the limbs. The young of these melanotic insular forms are described by Braun as brown above, with dark spots and lines, dark brown or black on the sides, with numerous blue spots, the tail dark green; the belly is greenish in the middle, black spotted with blue on the sides¹.

Measurements (in millimetres):—

	Mahon.		Ayre Id. (types).	
	♂.	♀.	♂.	♀.
From snout to vent	70	62	64	61
„ „ fore limb	28	22	28	23
Length of head	18	14	17	15
Width of head	12	9	12	9
Depth of head	9	7	9	7
Fore limb	26	22	25	23
Hind limb	40	36	37	35
Foot	21	19	19	18
Tail	120	100	110	65 *

* Tail reproduced.

Particulars of some of the specimens examined (as in preceding table):—

	1.	2.	3.	4.	5.	6.
♂. Mahon	70	78	27	15	37	24-25
„ „	66	90	28	11	35	25-22
♀. „	61	70	29	10	30	23
„ „	60	82	27	11	37	22
♂. Minorca	62	80	26	10	36	21
♂. I. del Rey	64	85	27	11	35	22-24
„ „	64	83	30	9	37	23-24
„ „	67	79	28	11	35	20

¹ Very detailed descriptions of the colours and markings in living specimens have been given by Braun, *l. c.*

	1.	2.	3.	4.	5.	6.
♂. I. del Ayre	72	78	28	10	39	23
” ”	64	90	27	11	36	23-22
” ”	64	83	27	10	31	20
♀. ”	64	80	30	10	35	20
” ”	61	80	27	10	38	20-19
” ”	53	88	27	13	40	21
♂. I. Dragoneras	64	77	27	13	37	24-23
” ”	56	75	29	10	32	24
♂. I. la Guardia	62	76	23	14	32	18-19
” ”	62	85	26	12	35	19
” ”	60	86	26	15	36	22-21
♀. ”	56	70	28	11	30	17
” ”	52	72	27	15	32	19-20
” ”	51	79	28	14	34	18-17

Specimens from Mahon are figured on Pls. XXIII. fig. 1 and XXVI. fig. 6. One of the types of *L. bilfordi* from Ayre Island is represented on Pl. XXVI. fig. 7.

The absence of any trace of a keel on the dorsal scales distinguishes this variety from the preceding as well as from the vars. *serpa* and *tiliguerta*.

IV.—ITALY AND SICILY.

A. Typical form, var. *BREVICEPS* Blgr., var. *BRUEGGEMANNI* Bedr.,
and var. *NIGRIVENTRIS* Bonap. (Plates XXII., XXIII., XXIV., XXVIII.)

In dealing with the variations of the Wall-Lizards in Central Europe, we have had no difficulty in satisfying ourselves that, however great the differences between individuals brought together under the name of *L. muralis*, we are not mixing up forms which, if better understood, might be regarded as distinct species or subspecies, and that even if any of the differences noticed should prove constant in a district, we are only uniting under one name local or geographical variations for the future recognition of which the name of the species coupled with the locality is amply sufficient. But as soon as we extend our investigations south of the Alps, the problem becomes more difficult, and we find ourselves confronted with several more or less distinct forms, which, as they sometimes occur side by side in a locality, it is imperative to distinguish by different names—be they called species, subspecies, races, or varieties.

On the rank to be accorded to such forms, the opinions of the best herpetologists have differed very considerably in the past.

In the last revision of these lizards¹ I have, following the lead of the highest authority on this difficult subject, grouped the Wall-Lizards of Italy under three headings: the *forma typica* (subsp. *fusca* Bedr.), var. *brueggemanni* Bedr. (on

¹ Cat. Liz. iii. p. 28 (1887).

the authority of Bedriaga, not having been able to examine specimens of that form), and var. *tiliguerta* (subsp. *neapolitana* Bedr.).

The question whether the third assemblage represents a distinct species or should be regarded as formed of one or more subspecies or varieties of the true *L. muralis* has remained an open question. But a better understanding of the second form has led recent workers¹ to the conclusion that it is only a slight modification of the typical form, leading gradually to the more southern var. *nigriventris* of Bonaparte, with which it has even been proposed to unite it.

The identity of the brown *L. muralis* of Northern and Middle Italy with the lizard occurring north of the Alps has never been questioned; and there is, in fact, no means of telling one from the other. An excellent description, with figures, of this form will be found in Camerano's 'Monograph of the Lizards of Italy'², based chiefly on specimens from Piedmont, Liguria, Lombardy, Venetia, Tuscany, and Umbria. Some of the specimens from Liguria evidently belong to the var. *brueggemanni*, and the determination of the specimens from Naples³, Malta, and Linosa need revision. Bedriaga's var. *brueggemanni* and Bonaparte's var. *nigriventris* were placed by Camerano in the synonymy of *L. serpa*.

In his diagnosis of *L. muralis*, Camerano gives the depth of the head in the tympanic region as equal to the distance between the posterior border of the eye and the tympanum; while in *L. genei* and *L. serpa*, which he regards as specifically distinct, this depth is stated to equal the distance between the anterior border or the centre of the eye and the tympanum. Most of the Italian *L. muralis* f. *typica* examined by me agree with the majority of Central-European specimens in having the depth of the head equal to the distance between the centre of the eye and the tympanum⁴, but a few from Turin and Genoa agree with Camerano's definition. The hind limb may reach the collar in males⁵.

I here give particulars of some of the specimens (typical form) examined:—

		1.	2.	3.	4.	5.	6.	7.
Domo d'Ossola	 ♂	65	51	25	10	23	20-19	1
"	" ♀	58	60	27	8	27	23-21	2
Turin	 ♂	64	56	25	10	26	23	1
"	 "	62	58	25	11	25	24-21	1
"	 ♀	57	58	28	8	28	19	1
"	 "	57	55	29	8	22	23-21	1

¹ Lehrs, Zool. Anz. 1902, p. 227; Mchely, Ann. Mus. Hung. ii. 1904, p. 365.

² Mem. Acc. Torin. (2) xxxvii. 1885, p. 518.

³ This, Count Peracca informs me, is probably referable to the var. *brueggemanni*.

⁴ The same observation has been made on numerous specimens from Rome (var. *nigriventris*) by Positano Spada, Boll. Soc. Rom. i. 1902, p. 90.

⁵ Specimens from Turin and Florence.

		1.	2.	3.	4.	5.	6.	7.
Genoa	♂	63	60	24	10	28	22	2
„	♀	60	58	27	10	27	19	2
Portofino, nr. Rapallo . . .	♀	60	56	27	8	26	20	1
Ferriere, Apennines	♂	60	54	24	11	24	22-21	0
„ „	♀	57	54	25	11	24	24-25	1
Florence	♂	63	60	24	9	26	21-20	1
„	„	59	52	26	8	22	20-17	2

1. Length (in millimetres) from snout to vent. 2. Number of scales across middle of body. 3. Transverse series of ventral plates. 4. Number of plates in collar. 5. Number of scales and granules between symphysis of chin-shields and median collar-plates. 6. Number of femoral pores (on right and left sides, if differing). 7. Number of supraciliary shields in contact with second supraocular.

In the female from Ferriere (Pl. XXV. fig. 2) and in the young male from Genoa the snout is as short and as obtuse as in *L. horvathi* Méhely; but this is also the case in a few specimens from France.

The dorsal scales are distinctly keeled, and 37 to 50 transverse series correspond to the length of the head. The nasals usually form a very short median suture in the Turin specimens, but 3 out of 13 have the rostral forming a suture with the frontonasal¹. Two specimens from Turin have 5 upper labials anterior to the subocular, and one from Portofino has only three on one side. 22 to 29 lamellar scales under the fourth toe.

Measurements:—

	Turin.		Genoa.	
	♂.	♀.	♂.	♀.
From snout to vent	64	57	63	60
„ „ fore limb	25	21	25	22
Length of head	16	13	17	14
Width of head	11	9	11	9
Depth of head	8	6	8	6
Fore limb	22	19	23	21
Hind limb	35	29	36	32
Foot	18	16	19	17
Tail	123	115	140	115

Var. BREVICEPS.

Boulenger, Annuar. Mus. Zool. Nap. i. 1905, no. 29.

Professor Monticelli has been so kind as to send me for examination all the specimens of *Lacerta muralis* preserved in the Zoological Institute of the Naples

¹ Also in single specimens from Domo d'Ossola, Lanzo Valley, and Florence. Separation of the nasals appears to be found in at least 20 per cent. of the specimens from south of the Alps.

University, and among them I was much surprised to find six examples, in one bottle labelled "*Podarcis muralis*, var. *lineata*, Betta.—Napolitano, dono del Direttore, A. Costa, 1889," which belong to an undescribed variety, just distinguishable from the typical form and in many respects approaching *L. vivipara*. Had there been but one specimen, and had it come from a district where *L. muralis* and *L. vivipara* co-exist, I should have regarded this form as probably a hybrid between the two species. But there are six specimens, and it is not known where they come from; for I can hardly believe the indication "Napolitano" to be correct, and Prof. Monticelli, who has searched the registers of his Museum, informs me the locality whence they were procured has not been noted, and he cannot answer for the correctness of the habitat. I am therefore inclined to think they come from some part of Northern Italy, as they show a strong general resemblance to the typical form, and I consider it necessary to establish for them a distinct variety, under the suggestive name of *breviceps*.

In shape, the head (Pl. XXV. figs. 16 & 17) resembles that of *L. vivipara*; it is small and convex, once and one-third to once and two-fifths as long as broad, and its depth equals the distance between the anterior border of the eye and the anterior border of the tympanum; the snout is obtusely pointed. The neck is as broad as the head, or a little narrower. Body rather strongly depressed. Hind limb, in the males, reaching the axil or the shoulder; in the females, the elbow of the adpressed fore limb; foot a little longer than the head.

Head-shields as in the typical form, but frontal rather broader; nasal forming a short suture with its fellow, and, in two specimens, in contact on one side with the anterior loreal; granules between the supraciliaries and the supraoculars reduced to 3 to 10; parietals as long as broad or but slightly longer; occipital smaller than the interparietal, entirely absent in one specimen; temporal scales usually larger than in the typical form, the masseteric plate distinct and in contact with the upper temporal or separated from it by one series of scales; four upper labials anterior to the subocular.

Gular scales rather large (20 to 25 in a longitudinal series); gular fold rather feebly marked. Collar very feebly denticulate, with 8 to 10 plates.

Scales on body (Pl. XXV. fig. 18) rhomboidal or distinctly hexagonal, and more strongly keeled than usual in the typical form, 46 to 55 across the middle of the body; 3, or 2 and 3, transverse series correspond to one ventral plate, 24 to 36 to the length of the head. Ventral plates in 6 longitudinal and 23 to 28 transverse series.

Præanal plate large, bordered by one semicircle of small plates. Scales on the upper surface of the tibia keeled and much smaller than the dorsals. 22 to 24 lamellar scales under the fourth toe. 14 to 16 femoral pores on each side.

Upper caudal scales strongly keeled and more or less distinctly pointed behind, sometimes nearly as much as in *L. vivipara*.

The coloration is the same as in most examples of the typical form, with a dark lateral band, light-edged above and beneath, and a dark vertebral streak or series of spots; these markings are strongly defined in the very young; the belly of the males is marked with thick black dots, and the throat and breast are spotted with black in both sexes. This type of markings, which is frequent in the typical form of *L. muralis*, is also that which most nearly approaches the pattern of *L. vivipara*.

Particulars of adult specimens (as in the table, pp. 377-8):—

	1.	2.	3.	4.	5.	6.	7.
♂	51	55	25	9	21	15-16	1
„	41	48	23	9	21	16-15	2
♀	56	46	27	8	20	14-16	1
„	56	48	28	8	25	16	2
„	55	51	27	10	20	16	2

Measurements:—

	♂.	♀.
From snout to vent	51	56
„ „ fore limb	22	20
Length of head	13	12
Width of head	9½	9
Depth of head	7	7
Fore limb	18	18
Hind limb	27	26
Foot	15	14
Tail	97	104

Enlarged views of parts of a male specimen are given on Pl. XXV. figs. 16-18.

Prof. v. Méhely has recently (Ann. Mus. Hung. ii. 1904, p. 377) expressed the opinion that the Caucasian form *L. saxicola* is to be regarded as representing the ancestral stock out of which *L. vivipara* has been evolved. In my opinion, the variety here described establishes an even closer connection between the typical *L. muralis* and *L. vivipara* than is to be found in any of the Eastern forms yet described, including Nikolsky's *L. derjuginii*, which is also intermediate between the two species. A much closer knowledge of the variations of these lizards than we now possess is required before we can profitably speculate on this question.

Var. BRUEGGEMANNI.

Bedriaga, Arch. f. Naturg. 1879, p. 304, pl. xvii. fig. 1.

L. muralis, var. *nigriventris* Eimer, Zool. Stud. Capri, ii. p. 30 (1874).

? *Podarcis muralis*, var. *roseiventris*, part., Massalongo, Saggio Erp. Ven. p. 35 (1854).

Dr. de Bedriaga tells us that there occur on the high walls of the arsenal of Spezia and in the moat separating this from the road two forms of *L. muralis*, the *neapolitana* (*campestris*) and another resembling the typical form in size and form, but remarkable

for its pale green coloration with peculiar markings. This he proposed to designate as var. *brueggemanni*, after his friend the late Dr. F. Brüggemann, and regarded it as unquestionably forming the passage from the typical form to the var. *neapolitana*. He describes the head as rather strongly depressed, the masseteric disk small or absent, and the caudal scales slightly pointed. The largest specimen measures 180 millim., of which the tail takes up 120. The females are more "simply coloured" and more of a greenish brown than the males, of which he gives the following description from life:—Ground-colour yellowish green or pale green, with fine wavy black cross-streaks forming a network on the sides, which encloses many pale blue spots, the meshes on the shoulder considerably larger and representing the ocellus characteristic of the var. *neapolitana*. Upper surface of head brown, spotted with green. Limbs grey or green above, with pale green ocelli. Upper surface of tail greenish brown, with dark brown zigzag markings. Belly whitish, spotted with black, one spot to each shield; the outer series of ventral shields entirely blue; lower surface of head with white, black-edged ocelli.

The British Museum now fortunately possesses one of the type specimens (received from Dr. de Bedriaga) from which the above description was taken; and, quite recently, Mr. Bryan Hook presented to the Museum several specimens, captured by him on walls at Lerici, near Spezia, which agree with the types in most respects. Specimens from Genoa, Sestri Ponente, Portofino, Rapallo, and Bologna have also been received from Dr. Gestro, Prof. Camerano, Dr. Wolterstorff, and Dr. Werner. I have besides examined several specimens from Livorno and Bellagio belonging to the Basle Museum; and one from Mount Meta, Terra di Lavoro, belonging to the Museum of Naples University—this being the southernmost point whence this variety has hitherto been reported.

Particulars of some of the specimens (as in the table, pp. 377–8):—

		1.	2.	3.	4.	5.	6.	7.
Genoa	♂	65	58	25	11	29	22–23	0
„	„	63	56	24	11	25	21–20	0
„	„	62	59	24	11	26	24–23	2
„	„	62	58	23	12	26	19	2
„	„	62	62	24	9	27	23	1
„	„	61	63	25	11	26	18	0
„	„	61	57	22	11	22	21	1
„	„	60	57	23	8	23	20	1
„	„	60	65	25	11	26	21–22	2
„	„	58	58	25	9	28	22–21	*
„	♀	62	59	30	10	28	21–20	*
„	„	59	60	26	9	28	19	*
Sestri Ponente, nr. Genoa . . .	♂	65	60	23	9	28	23	1
„ „ „ . . .	„	60	62	25	10	25	23–22	0
„ „ „ . . .	„	58	60	24	11	24	21–22	1

		1.	2.	3.	4.	5.	6.	7.
Rapallo	♂	65	55	24	9	26	21	2
"	♀	60	57	26	10	27	17-18	*
Portofino, nr. Rapallo . . .	♂	65	58	24	9	25	21-22	1
" " "	♀	54	59	26	8	25	20-19	2
Spezia (type)	♂	64	51	24	11	30	23-24	0
Lerici	♂	68	58	24	10	26	25-22	2
"	"	65	58	23	10	29	23	1
"	♀	62	58	27	10	29	21-22	0
"	"	54	59	27	12	25	22-20	0
Bologna	♂	68	54	26	10	24	21-20	1
"	"	66	53	25	9	22	18-19	1
Mt. Meta, Terra di Lavoro .	♂	58	58	26	11	27	23-22	1

The dorsal scales are granular and distinctly keeled; 35 to 52 transverse series correspond to the length of the head, and 4, or 3 and 4, to one ventral plate. The scales on the tibia are appreciably smaller than those on the back. 24 to 28 lamellar scales under the fourth toe. The scales on the upper surface of the tail are rather strongly keeled, and are truncate or end in a very obtuse angle; 30 to 36 scales in the fourth or fifth whorl behind the postanal granules. Single specimens from Sestri Ponente, Portofino, Livorno, Bellagio, and Lerici are remarkable in the rostral shield forming a suture with the frontonasal; in four specimens¹ the granules between the supraciliaries and the supraoculars are reduced to from two to five. The masseteric shield is well developed, or even large, except in Bedriaga's type specimen, which is further aberrant in having the parietal shields transversely divided, as in the female from Vöslau noticed above. Two of the Lerici specimens have five anterior upper labials on one side, a third has five on each side.

Measurements:—

	1.	2.	3.	4.	5.	6.
From end of snout to vent	65	60	64	62	68	65
" " fore limb	27	21	26	24	27	25
Length of head	17	13	17	15	18	16
Width of head	11	9	11	9	11	11
Depth of head	8	6	8	6	9	8
Fore limb	23	19	24	22	23	25
Hind limb	35	31	37	34	35	38
Foot	19	16	21	18	19	21
Tail	110	73†	98†	130	115†	125

† Tail reproduced.

- | | |
|----------------------|-----------------------|
| 1. ♂. Rapallo. | 4. ♀. Lerici. |
| 2. ♀. " | 5. ♂. Bologna. |
| 3. ♂. Spezia (type). | 6. ♂. Sestri Ponente. |

¹ Marked * on the table.

As may be seen from the above-given measurements, the proportions do not differ from those of the typical form; nor does, as a rule, the shape of the head, although it may be very strongly depressed—its depth, in certain males from Liguria and Pianosa, not exceeding the distance between the eye and the tympanum. The hind limb reaches the shoulder or the collar in males, the axil in females.

As to the coloration, the passage from the typical form¹ is so complete that certain specimens may be referred almost equally well to the one form as to the other. For instance, one of the females from Lerici has the black network on the back much broken up and a well-marked light dorso-lateral streak, and would be unhesitatingly classified as *f. typica* but for the rather large black spots on the belly, arranged in regular longitudinal series. For it is frequently the case in this variety that the black spots run together to form longitudinal bands. The dorsal markings are very variable, usually affecting the form of a close network, but sometimes appearing in disconnected blotches or vermicular lines; a vertebral chain of black spots may be present. Black and white spots form very regular and conspicuous bars on the sides of the tail.

Dr. Gestro has very kindly sent me a large number of specimens of the Wall-Lizard collected indiscriminately in the immediate vicinity of Genoa; this series goes far to show the instability of the characters on which the distinction between the var. *brueggemanni* and the typical form rests. Some specimens are not at all separable from the latter, while others, of the most vivid grass-green on the back (Pl. XXII. fig. 2), answer to the former; and between these two extremes every possible variation in shade may be followed. A female with the markings as in the typical form, but remarkable for its green back and yellow lower parts, is figured on Pl. XXII. fig. 3. The back may be coppery brown, or greyish brown, or greenish grey or olive, or green in front and brown behind. The colour of the lower parts varies equally, and irrespective of that of the upper parts. Most specimens are white on the belly, often with a brownish, pinkish, or greenish tinge, uniform or more or less spotted with black; while in one male specimen with olive-green back the lower parts are copper-red, with black spots confined to the collar-plates and to the two outer rows of ventral plates (Pl. XXII. fig. 1). An interrupted or continuous series of turquoise-blue spots is always present on the outermost row of ventral plates. The back, in the males, is always much spotted or reticulated with black or dark brown, and a black vertebral line or regular series of spots is often present; the sides are brown or purplish, with black network, often enclosing round blue or green spots; a blue, black-edged ocellus is often present above the axil. One of these specimens (Pl. XXIII. fig. 3) is so strikingly similar in its markings to certain males of the var. *quadrilineata* that it might easily be mistaken for that variety were it not for the flatter head; and it is noteworthy that its exceptionally

¹ Especially from such individuals as have been named var. *nigriventris* (non Bonaparte) by De Betta, Erp. Venet. p. 154 (1857).

small scales (65 across the middle of the body) is a further approximation to the Corsican-Sardinian form. Camerano has already pointed out that some of the Ligurian specimens examined by him, with a much flattened head and reticulate markings, are suggestive of the var. *bedriagæ* from the mountains of Corsica. I am much inclined to think that the vars. *quadrilineata* and *bedriagæ* are directly derived from the var. *brueggemanni*¹. I may add that quite young specimens from Lerici, which I provisionally refer to this variety, lack the dorsal reticulation and the ventral spots, and cannot be distinguished from French specimens of similar size.

Var. NIGRIVENTRIS.

Podarcis muralis, var. *nigriventris* Bonaparte, Icon. Faun. Ital., Anfib. pl. —. fig. *b* (1836).

Lacerta muralis neapolitana, var. *nigriventris* Bedriaga, Arch. f. Nat. 1879, p. 277, and Abh. Senck. Ges. xiv. 1886, p. 213.

Lacerta muralis fusca, var. *nigriventris* Bedriaga, Arch. f. Nat. 1879, p. 288, pl. xvii. fig. 3.

Lacerta muralis neapolitana, var. *ventromaculata* Bedriaga, Bull. Soc. Zool. France, 1879, p. 205.

Lacerta muralis, var. *flaviundata* Bedriaga, l. c. p. 218.

Under this name Bonaparte has figured a Wall-Lizard, from Rome, measuring 210 millim., which has been regarded by Bedriaga as a variety of his subspecies *neapolitana*, on account of its large size and the green colour of the spots which appear between the meshes of the black network. Similar lizards occur, according to Bedriaga, at Arezzo in Tuscany, in the Roman Campagna, on a rocky islet, La Scuola di Pianosa, close to Pianosa, in the Adriatic, and on Palmajola and Salina, Lipari Islands.

In describing his *L. muralis fusca*, var. *nigriventris*, from Rome, Bedriaga distinctly disclaimed any identification with Bonaparte's var. *nigriventris*, and he soon after altered the name to *flaviundata*. This variety is described, from a single male specimen (now in the British Museum), as deep black above, with numerous golden-yellow wavy cross-streaks; the white ground-colour of the belly to a great extent disappears under the large black spots; the ventral shields of the outer row are green. On comparing the figure with that given by him of *L. brueggemanni* on the same plate, a striking resemblance in form and markings will be observed between the two lizards, the chief difference being that the black is more developed in var. *flaviundata* and the green colour is replaced by yellow.

I owe to the kindness of my friend Dom Grégoire Fournier, O.S.B., an interesting little series of these black lizards collected by Dom Theodore Nève, O.S.B., on the outer walls of Rome, near St. Peter's, and the series is of importance as completely bridging over the gap between the var. *flaviundata* and the var. *nigriventris*, which are seen to represent merely individual differences. The specimens reached me quite fresh, and

¹ Since this paper was set up in type, I have received from Prof. Camerano a male specimen from Pianosa, which may well be regarded as intermediate between the vars. *brueggemanni* and *bedriagæ*. It has 70 scales across the body. Specimens from Elba, communicated to me by Count Peracca, are true var. *brueggemanni* with 58 to 65 scales across the body.

showed the ground-colour between the black network to be lemon-yellow in some, yellowish green to bright grass-green in others. I have since received a few living specimens, also from Rome, through Dr. Vinciguerra. In addition to these, the British Museum possesses one specimen from Castelfranco, Ostia (near woods), presented by Dr. Sambon, and one from the Roman Campagna, received from Prof. Collett.

	1.	2.	3.	4.	5.	6.	7.
♂. Rome (<i>flaviundata</i> , type)	64	62	25	10	22	18-19	2
♂. Outer walls of Rome	76	57	26	9	23	19-20	1
„ „ „	73	67	25	9	26	19-20	1
„ „ „	70	71	24	10	26	20-21	2
„ „ „	67	64	25	8	25	19-20	1
„ „ „	65	63	25	10	25	20-19	1
„ „ „	65	64	24	10	23	21-20	1
„ „ „	64	64	24	8	22	21-22	1-2
„ „ „	60	65	26	11	25	21-23	1
♀. „ „	66	58	27	9	24	19-18	1
„ „ „	66	62	26	9	24	20	1-2
„ „ „	52	64	26	9	24	20-21	1
♀. Castelfranco, Ostia	62	64	28	11	29	21	1
♀. Campagna, nr. Rome	67	55	29	9	26	20-19	1

Measurements :—

	1.	2.	3.	4.	5.	6.
From snout to vent	64	76	67	66	52	62
„ „ fore limb	26	30	27	25	19	25
Length of head	17	20	18	15	13	15
Width of head	11	13	11	10	8	9
Depth of head	8	10	9	7	6	7
Fore limb	24	25	25	23	18	21
Hind limb	36	39	?	35	27	34
Foot	20	21	?	19	15	18
Tail (reproduced)	105	125	107	98	60	92

1. ♂. Rome (type of var. *flaviundata*).
 2, 3. ♂. Walls of Rome.
 4, 5. ♀. „
 6. ♀. Castelfranco.

Head (Pl. XXVIII. fig. 1) once and a half to once and two-thirds as long as broad, moderately depressed, its depth, in the tympanic region, equal to the distance between the anterior border or the centre of the eye and the anterior border of the tympanum. Hind limb reaching the shoulder or the collar in males, the axil in females. Foot not more than once and one-third the length of the head, sometimes but slightly longer than the head.

Rostral not entering the nostril¹; frontal as long as its distance from the end of the snout or a little shorter; occipital often as long as, and sometimes much broader than, the interparietal (Pl. XXVIII. fig. 1); series of granules between the principal supraoculars and the supraciliaries incomplete, the first (or the first and second) supraciliaries being in contact with the second supraocular²; temporal scales granular, the tympanic and masseteric shields distinct, the latter more or less enlarged and in contact with the upper temporal shield or separated from it by one or two series of granules; supratemporal shield often small, sometimes broken up into small scales³; usually four upper labials anterior to the subocular, five on each side only in one specimen, five on one side in three. 22 to 29 scales and granules between the symphysis of the chin-shields and the median collar-plate; gular fold distinct. Collar without serration, composed of 8 to 11 plates. Scales on body granular, oval or oval-subhexagonal, strongly keeled; 55 to 71 scales across the middle of the body; 4 (or 3 and 4) transverse series correspond to one ventral plate, 37 to 51 to the length of the head. Ventral plates in 6 longitudinal and 24 to 29 transverse series. Præanal plate large, with one or two semicircles of small plates.

Scales on the upper surface of the tibia granular, strongly keeled, smaller than the dorsals. 18 to 23 femoral pores on each side. 27 to 31 lamellar scales under the fourth toe. Upper caudal scales strongly keeled, narrow, very obtusely pointed behind; 30 to 38 scales in the fourth whorl behind the postanal granules.

The coloration, which is the same in both sexes, is an exaggeration of the *brueggemanni* variety, the black predominating. Some specimens approach very nearly the latter in having the middle of the back green with a black network, whilst in general the black has so invaded the upper parts of the body that the yellow or green ground-colour is reduced to isolated spots, which may be as small as in the *filfolensis* variety; these spots may be round or wavy and transverse, as in Bedriaga's var. *flaviundata*, with every passage between the two forms. The sides are black, with round cream-coloured, yellow, or blue spots. The head in some specimens may be described as brown with black spots or vermiculations, in others as black with yellow or green variegations. The limbs are black, with yellow or green round spots. The lower parts are black and white, the black usually preponderating and often disposed in longitudinal bands; some specimens are nearly entirely black beneath, with mere remains of the white ground-colour. Large blue spots on the outer row of the ventrals, but never forming a continuous band as in Bedriaga's figure of the var. *flaviundata*. Tail with the black and white markings, usually so conspicuous on the sides in the typical

¹ Forming a suture with the frontonasal in one specimen. Another is remarkable in having two superposed postnasals.

² In the type of Bedriaga's var. *flaviundata* the supraciliary granules are reduced to 3 or 4.

³ In one specimen the parietal does not touch the postocular.

form, very strongly defined and forming nearly complete annuli, separated by brown interspaces; the regenerated portion, as in all Wall-Lizards, with black and light longitudinal streaks, strikingly contrasting with the annular markings of the primary tail.

The markings are the same in the young as in the adult.

Male specimens from Rome are figured on Pl. XXII. figs. 4-6, and a young one on text-fig. 6 *b*, p. 399.

Replying to my enquiries respecting the distribution of *L. muralis typica* and var. *brueggemanni* in Italy, my friend Count Peracca kindly informs me that he received alive, many years ago, a lizard, apparently answering to the var. *brueggemanni*, from Naples, which specimen has appeared in Camerano's list, but has since been mislaid¹. He has since made many excursions about Naples without rediscovering such a variety, nor has he found any other than the *serpa* or *neapolitana* variety south of Naples, even at altitudes of 1000 metres or above. In Liguria he found the var. *brueggemanni*, with lemon-yellow or green back, only near the sea; on the hills, from 100 metres upwards, only the ordinary grey-brown typical form. In the Arno Valley the var. *brueggemanni* follows the plain which extends inland rather far from the sea, and it even penetrates as far up as Florence, where, however, specimens intermediate between it and the typical form occur.

Much remains to be done in ascertaining the exact range of the typical form, the var. *brueggemanni*, and the var. *nigriventris* in Italy, and how far the three are capable of satisfactory definition. My own impression is that the first two intermix, in Liguria at least, where the southern and northern forms meet in the same localities, and that the same will be found to be the case between the second and third forms when we come to know more of the lizards occurring between Florence and Rome.

It has often been stated that the *serpa* or *neapolitana* form can be readily distinguished from the typical form by the shape of the head and the general proportions. How vague these differences are in most cases is well shown by these large lizards of the *nigriventris* variety, referred by some to the typical form, by others to the "*neapolitana*" form. And the resemblance to the latter is emphasised by a comparison with the black Filfolia lizard, which is regarded as derived from the Maltese "*neapolitana*." And yet there can be no doubt that the var. *nigriventris* is only an exaggeration of the var. *brueggemanni*, which is itself completely connected with the typical form of Northern Italy and Central Europe. As often happens in these lizards, the var. *nigriventris* has acquired with its larger size a finer scaling, which approaches

¹ As noticed above, a specimen from Mount Meta, not far from the Province of Naples, has been sent to me on loan by Prof. Monticelli.

that of the var. *serpa*, as may be seen by a tabulation of the number of scales in specimens of the different varieties and local forms:—

	1.	2.	3.	4.	5.
Var. <i>brueggemanni</i>	51-65	35-52	22-30	17-25	24-28
Var. <i>nigriventris</i> , Rome	55-71	37-51	22-29	18-23	27-31
Var. <i>serpa</i> , Rome, Naples	58-76	38-55	22-31	18-27	28-33
„ Malta	61-74	40-58	29-35	19-25	30-34
Var. <i>filfolensis</i> , Filfol	68-82	43-62	29-38	18-27	31-36

1. Number of dorsal scales in a transverse series. 2. Transverse series of dorsal scales corresponding to length of head. 3. Number of gular scales in a longitudinal series.
4. Number of femoral pores. 5. Number of lamellar scales under fourth toe.

B. Vars. CAMPESTRIS Betta and SERPA Raf.

(Plates XXIII., XXVII., & XXVIII.)

The forms to be described here have frequently been confounded, or grouped together under the same general designation, as by Bedriaga (*L. muralis neapolitana*), Camerano (*L. serpa*), and myself (var. *tiliguerta*). But it is really possible to distinguish a northern and a southern form—the former, var. *campestris*, being more sharply differentiated from the typical form, with its vars. *brueggemanni* and *nigriventris*, than the latter. While concentrating their attention on the colour, the markings, and the shape of the head, characters far less stable than one would gather from their writings, Bedriaga and Eimer have somewhat neglected the lepidosis, which, however subject to fluctuations within very wide limits, affords a safer means of defining forms. If the lepidosis be taken into consideration, together with the other characters, it will be found that, after elimination of the typical form and the two varieties into which it gradually transforms from north to south, two further varieties can be separated with sufficient precision. If we could put aside the more northern of the two latter, the var. *campestris*, we should feel perfectly justified in saying, that the Wall-Lizard passes gradually, at least so far as structural characters are concerned, from the typical form in the north to the var. *serpa* in the south, the drift of variation from north to south being in the direction of a larger size, a shorter body, smaller scales, longer toes, and smaller scales. But this continuous series is broken, or obscured, by the presence, from the plains of North Italy to the Roman province, of the var. *campestris*, which, further south, gradually passes into the var. *serpa*, especially as regards the coloration.

I fully agree with Eimer in regarding the striated type of the var. *campestris* as the most primitive of all the Wall-Lizards, and I am quite prepared to admit, so far as such speculations based on theoretical conceptions are allowable, that it has given rise, or at least is most nearly related, to the form that has become modified into both the

typical form and the spotted or reticulate types of the var. *serpa*. This is all the more plausible from the fact that the striated pattern is preserved, in females and young only, in the less divergent types of both the typical form and of the var. *serpa*. Some specimens of the latter are not at all to be distinguished, so far as markings are concerned, from the var. *campestris*. Eimer's theory of the derivation of patterns of markings being accepted as correct, we are led to regard the var. *campestris* as the most ancient form from which the others are descended; and this, I think, is also supported by the structural characters, which differ less from what we may assume to be the more normal or generalised form of *Lacerta* before adaptation to climbing petrophilous habits had been reached. The var. *campestris* has often, and rightly, been compared to such species as *L. viridis*, *L. agilis*, and *L. taurica*.

De Filippi and De Betta long ago pointed out that, although both the typical form and the var. *campestris* coexist in the plains of Northern Italy, they keep aloof from each other, the former being a true petrophilous lizard, while the latter has its abode in such localities as are frequented in Central and Northern Europe by *L. agilis*.

According to Lorenz Müller, who has recently published an interesting popular article on these lizards¹, the Wall-Lizard lives principally on walls and rocks, while the var. *campestris* (his *L. serpa*) prefers meadows, borders of woods, and other grassy localities; he tells us how sharply the territories of both forms are divided in a locality in Piedmont where he had an opportunity of observing them. It was on the road from Baldichiero to Montafia. On one side a steep rock with low prickly vegetation, on the other a grassy border separating the road from cultivated fields. This road forms an absolute boundary between the abodes of the two forms. The var. *campestris* is a form of the plain, rarely found, in isolated examples, in the mountains, which they exceptionally ascend along grassy valleys. At Imola, in Romagna, De Betta found "le due varietà *muralis* e *campestris* conviventi, sulle mura la prima, nella adjacente campagna la seconda." But in the south of Italy and in Sicily, where both the typical form and the var. *campestris* have practically disappeared, the var. *serpa* inhabits indifferently all localities, and runs up the walls and bare cliffs as well as among the grass.

What the factors are that have preserved the purity of the two races (f. *typica* and var. *campestris*) over so great a part of Italy, we do not know, but it is within the limits of direct observation that south of Rome a marked distinction between the two has ceased to exist, and this has caused much divergence of opinion among herpetologists as to the naming of certain specimens, as I have pointed out below. I am myself inclined to the conclusion that the vars. *brueggemanni* and *nigriventris* gradually lead to the southern form, as suggested by Bedriaga, when describing the former, and that, climatic or other conditions having changed, these extremes of the typical form

¹ Blätter f. Aq.- u. Terr.-Kunde, xiii. 1902, pp. 158, 169.

have mixed with the var. *campestris* and formed together the assemblage which we now designate as var. *serpa*. This explanation may account for certain reappearances of the characters of the typical form in Southern Italy, Sicily, and Malta, which have so greatly perplexed the best observers. The Sicilian specimens which have been distinguished as var. *sicula* have retained much of the general habits and coloration of the var. *campestris*, but the lepidosis is quite the same as in the var. *serpa*.

Var. CAMPESTRIS.

Podarcis muralis, var. *campestris* De Betta, Atti Acc. Verona, xxxv. 1857, p. 152; Faun. d'Ital., Rett. Anf. p. 28 (1874); Atti Ist. Venet. (5) iv. 1878, p. 897, and v. 1879, p. 388.

Lacerta tiliguerta De Filippi, N. Ann. Sc. Nat. Bologna, (3) v. 1852, p. 69.

Lacerta muralis neapolitana, vars. *campestris* and *livornensis* Bedriaga, Arch. f. Nat. 1879, pp. 274 & 279, and Abh. Senck. Ges. xix. 1886, pp. 209 & 223.

Lacerta muralis, var. *campestris* Leydig, Deutschl. Saur. p. 228 (1872); Eimer, Zool. Stud. Capri, ii. p. 25, pl. ii. fig. 3.

Lacerta muralis striata, part., Eimer, op. cit. p. 25.

Lacerta muralis striata campestris Eimer, Arch. f. Nat. 1881, p. 328, pl. i. figs. 1 & 2.

Lacerta serpa, part., Camerano, Mon. Saur. Ital. p. 56 (1885).

Lacerta muralis, var. *multifasciata* Positano Spada, Boll. Soc. Rom. Zool. i. 1892, p. 154, fig.

Head (Pl. XXVIII. figs. 2 & 2a) once and a half to once and two-thirds as long as broad, moderately depressed, its depth in the tympanic region equal to the distance between the anterior border or the centre of the eye and the anterior border of the tympanum; snout obtuse.

Neck as broad as or a little narrower than the head. Body moderately depressed. Hind limb reaching the shoulder, the collar, or a little beyond the collar in males, the axil or the elbow of the adpressed fore limb in females; foot once and one-sixth to once and one-third the length of the head. Tail cyclo-tetragonal at the base, once and two-thirds to twice as long as head and body.

Rostral shield narrowly separated from the nostril, or entering it¹; nasals always forming a suture behind the rostral; frontal usually as long as its distance from the end of the snout, sometimes considerably shorter; a series of granules between the supraciliaries and the two principal supraoculars, the first of which is usually in contact with the first supraciliary, rarely with the second also; in a few specimens² the series of granules beginning from the first supraocular; parietals once and one-third to once and a half as long as broad, usually in contact with the upper postocular, but sometimes not³; occipital very variable, usually shorter but often broader than the

¹ This I observe in several specimens from Turin, in one from Florence, in two from Castelfranco, near Rome.

² One from Venice, one from Bologna, one from Lake Trasimene, Perugia.

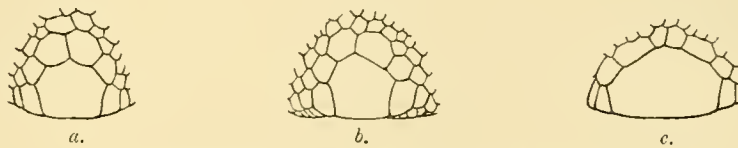
³ In four specimens from Turin, in two (out of four) from Lake Trasimene, in five (out of six) from Castelfranco, near Rome.

interparietal; temporal scales usually larger than in the typical *L. muralis*, with the tympanic shield always distinct and the masseteric frequently so, the latter separated from the parietal by a narrow supratemporal or by one to three series of scales; nearly constantly four upper labials anterior to the subocular¹.

Collar-edge more or less distinctly serrated (Pl. XXVIII. fig. 2*b*), sometimes as much as in *L. viridis*; 8 to 11 plates in the collar; gular fold very distinct; 21 to 32 scales and granules between the symphysis of the chin-shields and the median collar-plate.

Scales on the back roundish-hexagonal or oval-hexagonal, very distinctly, often sharply, keeled; the vertebral line usually with a more or less regular band of much smaller granular scales (Pl. XXVIII. fig. 2*c*); lower lateral scales as large as or a little smaller than the dorso-laterals, smooth or faintly keeled; 53 to 65 scales (usually 57 to 61) across the middle of the body; three or four transverse series of scales correspond to one ventral plate, 33 to 50 to the length of the head. Ventral plates in 6 longitudinal² and 23 to 31 transverse series. Anal plate smaller than usual in *L. muralis typica*, usually with two or three semicircles of small plates, but sometimes with one only.

Text-fig. 5.

Anal region of *Lacerta muralis*, var. *campestris*.

a. ♂, Turin. b. ♀, Turin. c. ♂, Ancona.

Scales on upper surface of tibia smaller than the dorsals, more or less strongly keeled; 24 to 30 (usually 25 to 29) lamellar scales under the fourth toe; 15 to 24 (usually 17 to 22) femoral pores on each side.

Upper caudal scales (Pl. XXVIII. fig. 2*c*) strongly keeled and obtusely but distinctly pointed behind; 30 to 40 scales in the fourth whorl behind the postanal granules.

Typical examples of this race, as represented by specimens from Verona, Venice, Treviso, and Turin (Pl. XXVII. figs. 1 & 2), have the upper surface of the head, a vertebral band, the sides of the body, the limbs, and the upper surface of the tail pale brown or olive-brown, the sides of the back bright grass-green; the brown vertebral band bears two parallel series of small black spots, or a single straight or zigzag series of large black spots; these spots, as a rule, do not begin until some way behind the occiput or nape; the sides, in females, bear two more or less distinct, straight or wavy, whitish streaks (the upper proceeding from the supraciliary border, the lower passing through the ear), which may be edged with black or bordered by small black

¹ Five on one side in one specimen from Lake Trasimene, three on each side in one from Ancona.

² The outer ventral plates are divided into two in a female specimen from Lake Trasimene.

spots, while in adult males they are spotted with black and white, the spots often forming ocelli; a large black spot or an ocellus with blue or green centre often present above the axil; black spots on the upper surface of the head present or absent; white black-edged spots on the hinder side of the limbs. Large male specimens have the upper surface of the head bright green. Lower parts white, greenish, yellowish, or reddish, without spots or with a series of black spots on the outer row of ventral plates, which may also bear blue or green spots, usually of small size. The young are always very distinctly streaked, and the two green dorsal stripes are narrower in proportion to the brown ones (text-fig. 6 c, p. 399).

Further specimens answering to the above description are in the British Museum from Bologna, L. Trasimene (Perugia), Florence, Ancona, Castelfranco near Ostia, Elba, and Corsica. De Betta himself had recorded his var. *campestris* from Corsica and Rome. More aberrant specimens are the following:—

Green colour absent¹, or reduced to a narrow streak on each side of the vertebral stripe (males and females from Turin and Trieste).

Olive above with three reddish-brown stripes, but no spots (female from Turin).

Pale brownish grey, with a pale green stripe on each side of the vertebral line; a trace of a whitish dorso-lateral line; no spots (female from the sandy shore at Ostia, near Castelfranco, Rome).

Five black stripes along the back, with narrow light streaks between them (var. *multifasciata* Positano Spada, from Ponte Salario, near Rome).

Green above, with a dorso-lateral series of large black spots; another lateral series of large black spots from axil to groin, and a third on the outer row of ventral plates, which are blue; no vertebral stripe or series of spots (var. *livornensis* Bedr., from Colambrone, near Leghorn).

Measurements:—

	1.	2.	3.	4.
From end of snout to vent . . .	70	62	60	60
" " " fore limb .	26	21	23	21
Length of head	17	13	15	13
Width of head	11	9	10	9
Depth of head	10	6½	8	7
Fore limb	22	19	20	19
Hind limb	37	32	34	29
Foot	20	17	18	15
Tail	128	118	100	102

1. ♂. Verona. 2. ♀. Treviso. 3. ♂. Turin. 4. ♀. Turin.

¹ One cannot, however, too much insist on the chameleon-like changes that take place in these and other lizards. We know how the male *L. agilis* may entirely lose its green colour towards the end of summer, and I have observed a brown lizard of the var. *campestris*, which in life showed no trace of green, turn to pale green on the anterior part of the back after a few hours' immersion in spirit.

Particulars of some of the specimens examined :—

		1.	2.	3.	4.	5.	6.	7.
Verona	♂	70	60	25	9	24	19-18	25
„	„	63	57	26	11	23	18	25
Venice	♀	50	57	28	11	30	19	28
Treviso	♂	76	61	27	9	25	21	27
„	„	72	58	27	9	25	20-19	26
„	„	70	59	27	11	29	20-21	29
„	„	70	57	28	11	32	21	25
„	♀	62	54	30	11	25	20	29
Turin	♂	64	55	28	9	22	17	27
„	„	58	58	29	11	30	18-16	28
„	„	58	58	26	10	21	18-17	24
„	„	50	61	28	9	23	20	26
„	♀	59	62	30	10	26	17-18	28
„	„	60	53	32	9	23	17	27
„	„	56	58	31	8	24	15-16	24
„	„	55	63	30	9	23	16	24
Bologna	♂	69	61	26	10	23	17-18	29
„	„	67	61	24	11	23	22-21	27
„	♀	52	61	29	10	25	20-19	26
Florence	♂	67	57	23	11	23	21-20	26
„	♀	64	56	29	10	23	18-19	26
Calambrone, Leghorn . . .	♂	74	64	26	9	25	19-20	30
Ancona	♂	65	60	25	10	22	20	25
L. Trasimene, Perugia . .	♂	82	61	26	10	25	22-23	27
„ „ . . .	„	68	62	26	10	25	22-19	27
„ „ . . .	♀	70	61	30	11	28	21	30
„ „ . . .	„	68	58	30	10	27	22	30
Castelfranco, Rome . . .	♂	77	65	25	8	27	22-20	29
„ „ . . .	„	70	60	27	10	23	18	27
„ „ . . .	„	68	58	26	11	27	24-23	29
„ „ . . .	♀	61	56	30	11	23	18	26
Rome	♂	66	63	28	11	26	21-19	30

1. Total length (in millimetres). 2. Number of scales across middle of body. 3. Transverse series of ventral plates. 4. Number of collar-plates. 5. Number of scales and granules between chin-shields and collar. 6. Number of femoral pores (right and left, if differing). 7. Number of lamellar scales under fourth toe.

Var. SERPA.

Lacerta serpa Rafinesque, Caratt. alc. n. Gen. Anim. p. 8 (1810).

Lacerta sicula Rafin. l. c.

Lacerta olivacea Rafin. l. c.

Lacerta puccina Rafin. l. c.

Podarcis muralis albiventris et *siculus* Bonap. Icon. Faun. Ital., Anf. (1836).

Lacerta muralis cærulea Eimer, Verh. phys.-med. Ges. Würzb. iii. 1872, Sitzb. p. ix, and Zool. Stud. Capri, ii. p. 5, pl. i. (1874).

Lacerta muralis neapolitana Bedriaga, Eust. d. Farb. b. d. Eidechs. p. 15 (1874).

Lacerta faraglionensis Bedriaga, op. cit. p. 16, pl.—, and Die Faraglione-Eidechse (1876).

Lacerta muralis, vars. *striata*, *elegans*, *modesta*, *maculata* Eimer, Zool. Stud. Capri, ii. p. 24, pl. ii.

Lacerta muralis, var. *viridiocellata* Bedriaga, Arch. f. Nat. 1877, p. 113.

Lacerta muralis neapolitana, part., Bedriaga, Arch. f. Nat. 1878, p. 285, Bull. Soc. Zool. France, 1879, p. 202, Arch. f. Nat. 1879, p. 274, and Abh. Senck. Ges. xiv. 1886, p. 204.

Lacerta muralis, vars. *faraglionensis*, *latastii*, *viridiocellata* Bedriaga, Bull. Soc. Zool. France, 1879, pp. 207, 209, 211, pl. ix. fig. 4.

Podarcis muralis, vars. *albiventris*, *sicula*, *doderleini*, *maculata*, *viridiocellata*, *faraglionensis* De Betta, Atti Ist. Ven. (5) v. 1879, pp. 389–393.

Lacerta muralis maculato-striata, *punctato-striata*, *punctato-fasciata*, *striato-maculata*, *maculata*, *reticulata* (part.), *modesta*, *concolor*, *elegans*, *cæruleo-cærulescens*, *cærulescens monaconensis*, *cærulescens gallensis* Eimer, Arch. f. Nat. 1881, pp. 375–389, pls. xiii.–xv.

Lacerta serpa, part., Camerano, Mon. Saur. Ital. p. 56 (1885).

Near Rome the var. *serpa* occurs in addition to the vars. *nigriventris* and *campestris*, but further south the var. *campestris* is replaced by this very closely related form, which reaches a larger size, and which in many respects differs little from the typical *L. muralis*, especially if compared with the southern var. *nigriventris*. As in the latter, the head is generally more flattened, resembling less that of *L. viridis*, the temporal scales are smaller, more granular, the collar has the edge even, or, if serrated, less distinctly so than in var. *campestris*, the difference in size between the vertebral scales and the dorso-laterals is less marked, the subdigital lamellæ are usually fewer, and the caudal scales are more truncate posteriorly, their posterior border rarely forming a well-marked angle. But it is distinguished from the typical form and its vars. *brueggemanni* and *nigriventris* by generally smaller scales, more numerous femoral pores, and longer toes with more numerous lamellæ under the fourth.

The complete passage between *L. muralis typica* and the var. *serpa*, so far as scaling is concerned, is well expressed by the following tabulation¹ :—

	1.	2.	3.	4.	5.
Forma <i>typica</i>	42–62	29–45	19–30	13–25	22–28
Var. <i>brueggemanni</i> . . .	51–65	35–52	22–30	17–24	24–27
Var. <i>nigriventris</i>	55–71	37–51	22–29	18–23	27–31
Var. <i>serpa</i>	58–77	35–60	25–35	19–29	28–36

¹ 1. Number of scales across middle of body. 2. Number of transverse series of scales corresponding to the length of the head. 3. Number of scales along middle line of gular region. 4. Number of femoral pores. 5. Number of lamellar scales under fourth toe.

As regards the coloration, which is highly variable in individuals associating together, the resemblance to var. *campestris* is, as a rule, greater than to any other form, and some specimens approach the latter so closely that it is not surprising that most authors should have failed to draw a distinction between the two forms.

The head is often comparatively larger than in the typical form and the var. *campestris*; its width is contained once and a half to once and two-thirds in its length; its depth equals the distance between the anterior border or the centre of the eye and the anterior border of the tympanum; the snout is obtusely pointed and as long as or a little longer than the postocular part of the head.

The hind limb reaches the collar, or between the collar and the ear in males, the axilla, the shoulder, or the collar in females; foot once and one-sixth to once and a half the length of the head.

The tail is rounded in section and measures once and two-thirds to twice and four-fifths the length of head and body.

The rostral never enters the nostril and is nearly always separated from the frontonasal by the nasals¹; postnasal single; frontal as long as its distance from the end of the snout, or shorter; series of granules between the supraciliaries and the principal supraoculars rarely complete², the first supraciliary, and sometimes also the second, being in contact with the second supraocular; parietals once and one-third to once and a half as long as broad, nearly always in contact with the upper postocular³; occipital usually shorter but frequently broader than the interparietal; temporal scales granular, usually not much larger than the dorsals; tympanic shield distinct; masseteric shield usually present⁴, more or less developed, separated from the parietal or from the upper temporal by one to three series of scales; almost constantly four upper labials anterior to the subocular⁵.

Collar with even edge (Pl. XXVIII. fig. 3) or very feebly serrated, composed of 7 to 12 (usually 9 to 11) plates; 25 to 33 scales and granules in a longitudinal series between the symphysis of the chin-shields and the median collar-plate; gular fold distinct.

Dorsal scales (Pl. XXVIII. fig. 3a) very small, convex, round or roundish-hexagonal, more or less distinctly keeled, sometimes smaller still and irregularly disposed on the vertebral line; 58 to 77 scales across the middle of the body, usually 62 to 70; 3 and 4, 4, or 4 and 5 transverse series correspond to one ventral plate, 35 to 60 to the length of the head.

Ventral plates in 6 longitudinal and 23 to 30 transverse series. Præanal plates usually smaller than in the typical form and with two semicircles of small plates.

¹ The rostral forms a suture with the frontonasal in a female from Modica and in a male from Rome.

² Two specimens from Procida Id., one from Casamicciola Id., one from Ischia, one from Syracuse.

³ Exceptions in three specimens from Catania, in two from Lipari Id. (Plate XXVII. figs. 5, 5a), in one from Giglio Id., in one from Ponza Id., in one from Capri, in one from Pompeii, and in one from Messina.

⁴ Absent in two specimens from the Faraglioni, in one from Capri.

⁵ Five on each side in one specimen from Pompeii and in one from Messina.

Scales on upper surface of tibia minute, keeled, smaller than dorsals; 19 to 29 femoral pores on each side (usually 20 to 26); 28 to 36 lamellar scales under the fourth toe.

Upper caudal scales (Pl. XXVIII. fig. 3*a*) strongly keeled and truncate or very obtusely pointed; 30 to 38 scales in the fourth whorl behind the postanal granules.

The enormous amount of variation in colour and markings which this form undergoes, often irrespective of localities and among individuals living together, may be gathered from the above synonymy, and especially from the general accounts given by Eimer. Suffice it to say, for the purposes of the present work, that some specimens, females and young, closely agree in colour and markings with de Betta's var. *campestris* (Eimer's *striata*), which may be regarded as the primitive type from which the spotted, reticulate, and uniformly coloured forms are derived. The colour of the head and back varies from greyish brown to olive, grass-green, or bluish green; striated specimens are the exception, most of the specimens being spotted or reticulated with black (Pl. XXVII. figs. 4 & 6), the black spots often forming longitudinal series (Pl. XXVII. fig. 3), sometimes wavy cross-bands; some specimens show only faint traces of darker markings and lead to others which are uniformly olive or yellowish brown (*L. olivacea* Raf., *modesta* Eimer). A blue or green ocellar spot is often present above the axil, and sometimes acquires a large size. The lower parts are usually white or greenish white, and without spots, except on the outer row of ventral plates, which often bear blue or greenish-blue spots. In some specimens from Sicily (var. *sicula* Bp.), which in structural characters entirely agree with the var. *serpa*, the belly is orange or red in the males, yellow or white in the females, these specimens being further remarkable for the brilliant green colour of the back, bordered on each side by a more or less distinct whitish streak, as figured on Pl. XXVII. fig. 7¹.

The most remarkable colour-variation is that exhibited by the lizards found on the Faraglioni rocks close to Capri (var. *cærulea* Eimer, *faraglioneensis* Bedr.): black or bluish black above, with more or less distinct markings of a more intense black, sapphire-blue or greenish blue beneath; pale blue spots usually present on the sides; the supra-axillary blue ocellus always distinct (Pl. XXIII. fig. 2).

Specimens with blue belly and blue or blackish back, with or without lighter blue or green spots, are reported from the Mezzagiorno rock near Palmarola, and Santo Stefano Island near Ventotene. The vars. *cæruleo-cærulescens*, *cærulescens monaconensis*, and *cærulescens gallensis* of Eimer, from other small rocks near Capri, also with blue belly, are practically intermediate in the dorsal coloration between the var. *cærulea* and the lizards of Capri.

¹ J. Scherer, Blätter f. Aquar.-u. Terrar.-Kunde, xiv. 1903, p. 288, regards *L. sicula* as a species distinct from *L. serpa*, but I am unable to confirm the distinctive characters (collar, supraciliary shields, &c.) which he adduces in favour of such a separation.

¹ Tabulated as in var. *campestris*, above, p. 393.

		1.	2.	3.	4.	5.	6.	7.
Faraglioni	♂	71	69	27	12	29	21-23	30
„	♀	74	68	30	9	29	21-22	29
„	„	66	66	30	11	33	23-24	30
„	„	65	70	29	11	30	22	30
Giannutri Id.	♂	72	65	25	10	28	24-22	29
Reggio, Calabria	♂	62	68	26	11	31	26-28	29
„ „	♀	69	68	29	11	29	23-24	32
Lipari Id.	♂	69	73	26	9	28	24-23	33
„	♀	63	75	30	9	32	26	36
Stromboli Id.	♀	58	67	28	9	32	24-25	33
Messina	♂	76	74	26	12	31	25	34
„	„	74	76	23	12	27	22-24	31
„	♀	68	70	27	9	25	24-23	32
„	„	65	68	27	10	26	23-25	31
Catania	♂	84	76	24	13	27	25	31
„	„	75	77	27	13	29	24-25	35
„	„	75	71	25	11	27	23-22	29
„	„	56	60	26	9	25	22-23	29
„	♀	71	66	28	9	27	21-22	31
„	„	66	69	30	10	27	24	30
„	„	63	69	27	10	27	23-22	30
Syracuse	♂	64	65	26	13	27	25-23	32
Modica	♂	69	73	25	11	29	26-27	31
„	♀	66	65	29	11	27	23-22	31
Palermo	♂	62	58	25	8	26	19-20	28
Bosco di Marineo, Palermo	♂	70	65	27	11	25	22-23	30
(Pl. XXVIII. figs. 4, 4 a).								
Bosco di Marineo, Palermo .	♂	63	63	25	10	29	21-22	30
„ „ .	♀	64	60	29	9	27	21-19	30

Bedriaga, in his Monograph of 1886 (p. 190), records the typical form (his *fusca*) from Messina, but without particulars. Specimens from Messina, bearing a considerable resemblance in form and markings to the typical *L. muralis*, have been presented to the British Museum by Count Peracca, but in their scaling they agree with var. *serpa*.

An aberrant male specimen from Cosenza, Calabria, has been sent to me by Count Peracca, with the request that I should decide whether it must be referred to the var. *serpa* or to the var. *nigriventris*. It is, in fact, exactly intermediate between the two, both in form and coloration, and it approaches the specimens from Malta which will be described hereafter. Its lepidosis, as expressed in the above table, is:—

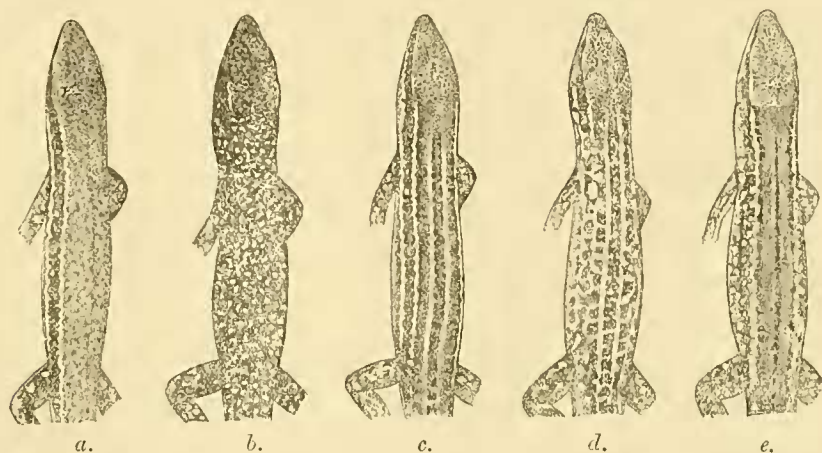
		1.	2.	3.	4.	5.	6.	7.
Cosenza	♂	76	66	24	9	27	22	30

This would apply equally well to var. *nigriventris* and to var. *serpa*. The head is once and two-thirds as long as broad and its depth equals the distance between the centre of

the eye and the tympanum. The hind limb extends to midway between the collar and the ear; the foot measures once and one-third the length of the head. The scales on the back are granular, oval-hexagonal, distinctly keeled; 3 and 4 transverse series correspond to one ventral plate, and 45 to the length of the head.

The body and the limbs are olive above (in spirit) with black spots forming a wide-meshed network; no distinct ocellar spot above the axil; the head is much spotted with black above, and a black streak runs along the sides, passing through the eye and above the tympanum, and continued on the neck; tail with blackish transverse bands with sharply defined white spots on the sides. The throat and belly are greyish white, with small black spots.

Text-fig. 6.



Young specimens of:—*a*, *f. typica*, Courmayeur, Piedmont; *b*, var. *nigriventris*, Rome; *c*, var. *campestris*, Turin; *d*, var. *serpa*, Pompeii; *e*, var. *serpa*, Messina.

V.—MALTA. (Plate XXVII.)

The Wall-Lizard of Malta has been identified by Bedriaga and myself with the Sicilian and South-Italian form (var. *serpa*), by Camerano with the typical form, while Eimer regards it as intermediate between the two. I regard Eimer's view as perfectly correct if size and coloration alone are taken into consideration, but the scaling is decidedly that of var. *serpa*.

Eimer, Arch. f. Nat. 1881, p. 370, who has observed the lizard in Malta, remarks as follows:—

“It is remarkably small for a Southern form, not larger than the Corsican [var. *quadrilineata*], which is not much larger than the German. Besides, it is *platycephalous* [like the typical form] and belongs to the *reticulata* type, more or less *nigriventris*, the neck, the sides, and the posterior part of the belly being more or less spotted with black. However little the latter character may be marked, it is, however, highly noteworthy that it should, as so frequently in North Italy, coincide with the reduction of

the large dorsal spots in a locality so far removed from the home of the *platycephalæ reticulatæ*, and so completely isolated. It is also striking that the shape of the head should alter simultaneously with the size, the colour, and the markings, for it must be noted that the Maltese form shows less green but more brown and yellow in its livery. We have therefore apparently to deal here with *correlative conditions* between the form of the head and the other factors. As the race derived from the Maltese lizard, the large, robust, black lizard of the Filfola rock, is pyramidocephalous¹, we feel inclined to conclude that a correlation exists between the shape of the head and the robust build."

I have not examined a very large number of lizards from Malta, but I find that, if they agree in the shape of the head with the typical form, as is also the case in many Sicilian and South-Italian specimens of the var. *serpa*, they certainly agree with the latter in the lepidosis, as may be seen from the following tabulation:—

	1.	2.	3.	4.	5.	6.	7.
♂	71	61	27	11	35	25	34
♂	63	64	25	9	30	23-24	30
♂	59	74	27	9	31	19	30
♀	57	68	29	9	31	20-22	33
♀	57	64	30	11	29	24-22	32

The depth of the head equals the distance between the centre of the eye and the anterior border of the tympanum. The hind limb reaches the collar, or a little beyond, in males, the axil in females; the foot measures once and one-third the length of the head.

The rostral shield does not enter the nostril, and in two specimens it is in contact with the frontonasal; the series of granules between the supraciliaries and the supraoculars is incomplete, the first supraciliary being in contact with the second supraocular; the parietal is in contact with the upper postocular; occipital as large as or smaller than the interparietal, in one specimen a little larger and twice as broad; supratemporal narrow or broken up; temporal scales small, but much larger than dorsals; tympanic and masseteric shields usually well developed; usually four upper labials anterior to the subocular².

Collar even-edged; gular fold well developed.

Dorsal scales granular-subhexagonal, faintly keeled; 4 or 4 and 5 correspond to one ventral shield, 40 to 58 to the length of the head; scales on upper surface of tibia smaller still.

Upper caudal scales rather strongly keeled, truncate.

¹ This is true only of adult males.—G. A. B.

² A young specimen, received from Prof. Giglioli, has five anterior upper labials on both sides and lacks the masseteric disk.

The upper parts are greyish olive, in spirit, with a darker lateral band, with or without a vertebral series of small blackish spots, or reticulate all over with brown or black, the network enclosing roundish pale spots; on the posterior part of the back the dark markings may form wavy transverse bands; the head is sometimes uniform olive-brown above, sometimes much spotted with black; the lower parts are unspotted, or with rather small black spots, forming regular longitudinal series along the rows of ventral plates. On the whole, as noticed by Eimer, the coloration bears much resemblance to that of *L. muralis* (typ. and var. *brueggemanni*) as occurring near Genoa.

The young is covered with dark and light spots, with a dark lateral band edged above and below with whitish.

According to Eimer, the colour of the back in life is yellowish green or yellow; the belly saffron-yellow or red.

Measurements:—

	♂.	♀.
From end of snout to vent	71	57
" " " fore limb	28	21
Length of head	17	12
Depth of head	11	7½
Fore limb	24	20
Hind limb	43	30
Foot	24	18
Tail (reproduced).	107	85

The Wall-Lizard of Linosa (Pl. XXVII. fig. 8.), referred by Camerano and myself to the typical form, agrees in all essential respects with that from Malta, judging from the single specimen at my disposal, received from Prof. Giglioli. It has 68 scales across the body, 28 gulars in a longitudinal series, 23 femoral pores on each side, and 34 lamellar scales under the fourth toe. The belly is spotted with black.

The following form, from the Filfolia Rock, south of Malta, is evidently derived from the Maltese lizard, just as the Faraglioni lizard is derived from that living on Capri. But while in the latter case the distinction rests entirely upon the darkening of the ground-colour—size, scaling, and markings having remained exactly the same,—we here find that the melanism is obtained by an invasion of the black markings, and this difference is accompanied by an increase in size and, on an average, smaller scales. The Filfolia form is therefore entitled to the same rank as the var. *nigriventris*, which stands to the typical form exactly in the same relation as the var. *filfolensis* does to the var. *serpa*.

Var. FILFOLENSIS.

Zootoca lilfordi, part., Günth. Ann. & Mag. N. H. (1) xiv. 1874, p. 158.

Lacerta filfolensis Bedriaga, Die Faraglione-Eidechse, p. 19 (1876); Braun, Arb. zool. Inst. Würzb. iv. 1877, p. 49, pl. i. fig. 14; Bedriaga, Arch. f. Nat. 1878, p. 297.

Lacerta muralis, var. *filfolensis* Eimer, Arch. f. Nat. 1881, p. 408, pl. xv. fig. 24; Bedriaga, Abh. Senek. Ges. xiv. 1886, p. 218.

Podarcis muralis, var. *filfolensis* De Betta, Atti Ist. Ven. (5) v. 1879, p. 392.

Günther had only two specimens of the Filfol lizard before him when he published his remarks on *Zootoca lilfordi*, and both Bedriaga and Eimer do not appear to have had access to any very large material when writing their descriptions. The figures accompanying Braun's remarks were taken from one of Günther's specimens in the British Museum, but are very inaccurate, as the author himself suspected. A few years ago, my friend Mr. Norman Douglass visited the Filfol Rock, and collected a good number of specimens, which he has kindly presented to the British Museum. The following description is based on 15 specimens, measuring from 56 to 82 millimetres from snout to vent. Eimer's largest specimen (male) measured 90 millimetres without the tail.

The depth of the head (Pl. XXVIII. fig. 5) equals the distance between the centre or the anterior border of the eye and the tympanum; its width is once and a half to once and three-fifths in its length. The hind limb reaches the shoulder, the collar, or a little beyond in males, the elbow of the adpressed fore limb, the axil, or the shoulder in females; the foot measures once and one-fourth to once and a half the length of the head.

Except in two specimens, the rostral shield does not enter the nostril; the nasals form a suture behind the rostral; the frontal is as long as or considerably shorter than its distance from the end of the snout; a series of granules between the supraciliaries and the two principal supraoculars, this series complete in five specimens, whilst in nine the first supraciliary is in contact with the second supraocular, and the second supraciliary also in one specimen; parietal once and one-third to once and two-thirds as long as broad, in contact with the upper postocular, except in one specimen; occipital very variable in size, as long as or shorter than the interparietal, sometimes wider than the latter; supratemporal narrow or broken up; temporal scales small, but much larger than the dorsals; tympanic shield distinct; masseteric shield usually well developed; four upper labials anterior to the subocular.

Collar even-edged; gular fold distinct.

Dorsal scales granular-subhexagonal, feebly or faintly keeled; 68 to 82 scales across the middle of the body; 4 and 5 correspond to one ventral plate, 43 to 62 to the length of the head; ventral plates in 6 longitudinal and 26 to 31 transverse series. Anal plate rather large, bordered by one or two semicircles of small plates.

Scales on upper surface of tibia smaller than dorsals; 18 to 27 femoral pores on each side; 31 to 36 lamellar scales under the fourth toe.

Upper caudal scales strongly keeled, truncate; 34 to 42 scales in the fourth whorl behind the postanal granules.

Eimer describes the colour of the living male lizard as intensely black above, with small roundish spots or dots which are greenish yellow on the middle of the back, more

green or bluish on the sides; lower down on the sides the spots are quite blue; a cobalt-blue spot in the axil; the ventral shields are reddish brown or rusty red in front, blackish grey or bluish black behind; a series of blue spots on the outer row of ventrals. This coloration, which, as pointed out by Eimer, may easily be derived from that of the Maltese lizard, is strikingly similar to that described by Costa in his *L. acrolampra* from Aspromonte, Calabria¹, and is also very similar to that of Bonaparte's var. *nigriventris*. The female is described as having the upper parts often more purplish brown, especially along the vertebral line, and the belly of a paler rusty red, fading to flesh-colour or pale reddish brown under the limbs and tail; the throat pale blue, spotted with black and reddish brown.

Specimens in spirit are black above, with pale greenish-blue dots or small round or oval spots, which are usually larger on the sides; the upper surface of the head is brownish black, uniform or with small pale spots. A female specimen is entirely black above. The belly varies from dark grey to bluish black; in some of the males, black spots form regular longitudinal bands on the ventral plates. The tail sometimes bears light spots, above and beneath.

Particulars of specimens examined :—

	1.	2.	3.	4.	5.	6.	7.
♂	82	78	26	10	29	18-20	33
„	82	75	28	12	36	23	?
„	80	75	26	10	33	23	?
„	76	80	26	9	38	27	32
„	75	82	27	11	36	24	34
„	75	80	28	10	33	25	33
„	74	74	27	10	35	26-25	36
„	67	71	26	10	35	24	31
♀	74	69	31	10	33	24	35
„	70	75	29	10	32	22	31
„	69	72	29	10	31	24	32
„	65	77	29	10	36	20-21	32
„	63	68	28	11	37	25	36
„	56	79	28	11	33	21-23	32
„	56	77	28	8	32	22	33

Measurements :—

	♂.	♀.
From end of snout to vent	82	70
„ „ „ fore limb	30	25
Length of head	20	15
Width of head	13	10

¹ Fauna di Aspromonte, p. 75 (1828).

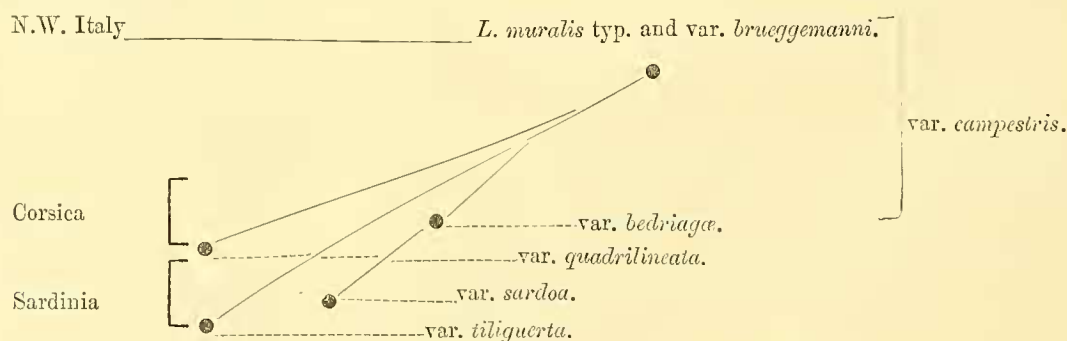
	♂.	♀.
Depth of head	10	7
Fore limb	29	22
Hind limb	46	38
Foot	24	20
Tail	135	125

A male specimen is figured on Pl. XXVII. fig. 9.

VI.—CORSICA AND SARDINIA.

(Plates XXII., XXVIII., XXIX.)

In their Lizards, as in many other animals, Corsica and Sardinia show much in common. The presence in the former island, as well as in Elba, of the var. *campestris*, undistinguishable from that of Northern and Middle Italy, points to its former connection with these parts of the Peninsula; and I would regard the other varieties found in Corsica (*quadrilineata* and *bedriagæ*) as directly derived from the typical form of the wall-lizard through the var. *brueggemanni*. Sardinia appears to have been stocked from Corsica, possessing, in addition to the var. *quadrilineata*, a larger form, the true var. *tiliguerta*, which is particularly closely related to the var. *bedriagæ*, the latter appearing to be nearly completely connected, so far as its characters are concerned, with the still more extreme form described by Peracca as *L. sardoa*. Although owing to its general appearance the true *tiliguerta* has usually been confounded with the var. *serpa* of Southern Italy and Sicily, the frequent greater elongation of the parietal shields, which, as a rule, do not touch the upper postoculars, is a character which approximates it to the var. *bedriagæ* and indicates, in my opinion, closer genetic affinity to the latter than to the former. The relationships and distribution of these various forms may be expressed by the following diagram:—



As mentioned above, the var. *bedriagæ*, isolated on the mountains of Corsica (700 to 1200 metres), finds its nearest allies in some specimens of the var. *brueggemanni* from the Ligurian coast, which, as pointed out by Eimer and by Camerano, are remarkable for their strongly depressed head and reticulate markings. I have also drawn attention

to the close resemblance between other Ligurian specimens of the var. *brueggemanni* and the var. *quadrilineata*, which, as we now know, was confounded with the typical form (*L. muralis fusca*) by no less an authority than Bedriaga.

Var. CAMPESTRIS.

Lizards of this variety, undistinguishable from individuals from Northern and Middle Italy, described above, p. 390, occur in Corsica, in Elba¹, and in Montecristo.

Lorenz Müller², who confounds the var. *campestris* with *L. serpa*, says they are found in the grassy ditches along the roads near Bastia, whilst the walls are occupied by lizards of the var. *quadrilineata (genei)*. At Biguglia near Bastia, among the reed-grass along the coast, he only found the var. *campestris*. Higher up, in the valleys, it is rare, a few specimens having been captured at Corte (396 m.), Tattone (802 m.), and Vizzavona (824 m.).

I append particulars of three specimens, for comparison with the table on p. 393:—

		1.	2.	3.	4.	5.	6.	7.
Corsica	♀	70	52	27	11	24	18-19	25
Elba	♂	64	58	26	10	26	19-17	26
Montecristo	♂	53	57	25	11	27	21-22	28

In the specimen from Elba, as well as in that from Montecristo, the parietal does not touch the upper postocular. The specimen from Corsica has only three upper labials anterior to the subocular, on both sides.

Measurements:—

	♂, Elba.	♀, Corsica.
From end of snout to vent	64	70
" " " fore limb	24	25
Length of head	16	15
Width of head	11	10
Depth of head	9	8
Fore limb	23	21
Hind limb	37	35
Foot	20	18
Tail	120	116

Var. QUADRILINEATA.

Zootoca quadrilineata Gray, Ann. N. H. i. 1838, p. 279.

Lacerta podarcis, var. *genei* Cara, Mon. Lacert. Sard. p. 32 (1872).

Podarcis muralis, var. *lineata* De Betta, Faun. d'Ital., Rett. Anf. p. 29 (1874), and Atti Ist. Venet.

(5) iv. 1878, p. 901, and v. 1879, p. 389.

Podarcis tiliguerta, part., Camerano, Atti Acc. Torin. xiii. 1877, p. 87, pl. ii. fig. 1.

¹ Where, according to information received from Count Peracca, since the setting up in type of this paper, it occurs, along with the var. *brueggemanni*, at all altitudes as well as at sea-level.

² Blätter f. Aquar.- u. Terrar.-Kunde, xiii. 1902, p. 169.

Lacerta muralis neapolitana, part., Bedriaga, Arch. f. Nat. 1879, p. 274.

Lacerta muralis fusca Bedriaga, Arch. f. Nat. 1883, p. 268, and Abh. Senck. Ges. xiv. 1886, p. 175.

Lacerta muralis fusca, var. *corsica* Bedriaga, Arch. f. Nat. 1883, p. 269, and op. cit. p. 177.

Lacerta taurica genei Camerano, Mon. Saur. Ital. p. 49 (1885).

Lacerta muralis genei Camerano, Boll. Mus. Zool. Torin. i. 1886, no. 7.

Lacerta muralis neapolitana, var. *lineata* Bedriaga, Abh. Senck. Ges. xiv. 1886, p. 213.

Lacerta muralis, var. *genei* Méhely, Ann. Mus. Hung. ii. 1904, pp. 365 & 366.

Head (Pl. XXVIII. fig. 6) about once and a half to once and two-thirds as long as broad, moderately depressed, its depth in the tympanic region equalling the distance between the anterior border or the centre of the eye and the anterior border of the tympanum; snout pointed. Neck as broad as the head. Body moderately depressed. Hind limb reaching the collar or between the collar and the ear in males, the shoulder or the collar in females; foot once and one-fourth to once and a half as long as the head; toes rather long and slender, more compressed than in the typical form. Tail once and three-fourths to twice and one-fifth as long as head and body.

Rostral shield narrowly separated from the nostril or, frequently, entering it; nasals forming a suture behind the rostral¹; frontal as long as its distance from the end of the snout; a series of granules between the supraciliaries and the two principal supraciliaries, this series either complete or beginning behind the first supraciliary²; parietals once and one-fourth to once and a half as long as broad, often³ not touching the upper postocular; occipital often as long as and broader than the interparietal; a single postnasal⁴; temporal scales small and granular; tympanic and masseteric plates always present, the latter separated from the parietal by one to three series of scales; upper temporal shield small, often broken up into scales; normally four labials anterior to the subocular⁵.

Collar even-edged, with 9 to 13 plates; gular fold distinct; 27 to 40 scales on a line between the symphysis of the chin-shields and the median collar-plate.

Dorsal scales small, round or oval, very convex, smooth or feebly keeled, 56 to 75 across the middle of the body, 3 and 4, 4, or 4 and 5 transverse series corresponding to one ventral plate, 40 to 57 to the length of the head. Ventral plates in 6 longitudinal series⁶. Anal plate rather small, usually bordered by two semicircles of small plates.

¹ I have noted two exceptions, in specimens from Orezza and Ajaccio, in which the rostral forms a narrow suture with the frontonasal, and Méhely mentions another in a specimen from Bonifatto, Corsica.

² The series is complete in 20 specimens out of 45 from Corsica, and in 4 out of 13 from Sardinia.

³ In 11 specimens from Ajaccio, and in one from Corte, Corsica.

⁴ F. Müller (Verh. nat. Ges. Basel, vii. 1882, p. 156) has mentioned two postnasals in two specimens from Ajaccio, but this appearance is simply due to the intercalation of a small shield between the nasal and the loreal, well above the nostril.

⁵ Five on both sides in two specimens from Ajaccio, five on one side only in three specimens, and three in two specimens.

⁶ In one specimen from Corte, Corsica, a few of the plates of the outer row are divided into two.

Scales on upper surface of tibia as large as or a little smaller than dorsals, keeled; 18 to 28 femoral pores on each side, usually 21 to 25; 27 to 34 lamellar scales under the fourth toe, usually 30 to 33.

Caudal scales truncate, upper rather strongly keeled, 30 to 37 in the fourth whorl behind the postanal granules.

Brown, olive, or green above, usually spotted or marbled with blackish and with a yellowish or whitish dorso-lateral streak or series of spots; frequently a blackish vertebral streak or series of spots; sides, in males, usually blackish, with numerous round light spots; females frequently uniform yellowish brown or mahogany-brown on the back, with a yellowish, black-edged dorso-lateral streak from the eye to the tail, and another, wider, light streak from the ear to the groin (Pl. XXIX. fig. 2); limbs with round, dark-edged, light spots. Lower parts white or yellow, without or with black spots, which are usually confined to the throat and the outer row of ventral plates. According to Lorenz Müller, the lower parts are sometimes bright orange in males.

The following notes are taken from living specimens from Sardinia, for which I am indebted to Count Peracca, and three of which are figured (Pl. XXIII. fig. 4, & Pl. XXIX. figs. 1, 4).

Coppery brown, yellowish brown, greenish yellow, or bright green above; white, with mother-of-pearl sheen, or greenish yellow beneath; turquoise-blue spots always present above shoulder and on outer ventral plates; some specimens with numerous blue spots on the sides, alternating with green or greenish-yellow ones; the dorso-lateral streak pale brownish or greenish yellow.

Specimens in which the black markings preponderate, the light ground-colour appearing as four dorsal lines with small spots or cross-lines between them, have been named by Bedriaga var. *corsica* (Pl. XXIX. fig. 3).

Measurements:—

	1.	2.	3.	4.	5.	6.
From snout to vent	69	59	60	60	59	55
" " fore limb	27	22	22	24	24	20
Length of head	16	13	14	15	15	11
Width of head	11	8	9	10	9	7
Depth of head	8	7	7	8	7½	6
Fore limb	24	20	20	21	22	19
Hind limb	40	35	35	36	37	31
Foot	22	18	19	20	20	17
Tail	130	90*	118	82*	118	100

* Tail reproduced.

- | | |
|--|---|
| 1. ♂. Flumini di Quarto, Sardinia. | 4. ♂. Orezza, Corsica (type of var. <i>corsica</i>). |
| 2. ♀. " " " | 5. ♂. Corte, Corsica. |
| 3. ♀. Sardinia (type of var. <i>quadrilineata</i>). | 6. ♀. " " |

Particulars of some of the specimens examined:—

				1.	2.	3.	4.	5.	6.	7.	
Flumini di Quarto, Sardinia	.	.	♂	69	63	27	10	28	23-22	34	
„	„	„	.	63	71	25	11	30	22	31	
„	„	„	.	60	64	26	9	35	24-23	33	
„	„	„	.	60	60	26	9	27	22-23	31	
„	„	„	.	58	72	26	9	29	24-25	31	
„	„	„	.	59	60	32	10	27	22	28	
„	„	„	.	55	67	29	11	29	19-18	29	
Lanusei, Sardinia	.	.	.	♂	61	70	25	11	40	27-28	31
„	„	.	.	„	48	75	25	14	36	23-22	31
„	„	.	.	♀	57	66	29	11	31	22-23	33
Sardinia ¹	.	.	.	♀	60	67	28	11	30	26-24	30
„	.	.	.	„	51	60	26	11	32	21-22	30
„	.	.	.	„	47	64	27	11	29	20	31
Orezza, Corsica ²	.	.	.	♂	60	60	24	9	29	21	32
Corte, Corsica	.	.	.	♂	59	58	26	10	28	23	34
„	„	.	.	„	57	65	26	11	30	25-26	30
„	„	.	.	„	50	60	26	10	28	23-22	29
„	„	.	.	♀	55	56	26	9	31	20-21	30
„	„	.	.	„	51	57	29	?	29	24-22	29
„	„	.	.	„	50	63	26	9	34	23-24	30
Ajaccio, Corsica	.	.	.	♂	56	75	25	11	32	23-25	28
„	„	.	.	„	56	72	24	11	30	22	?
„	„	.	.	„	55	69	26	13	28	21-22	31
„	„	.	.	♀	55	70	29	10	33	19	33
„	„	.	.	„	55	72	28	10	34	25	34

1. Length from snout to vent. 2. Number of scales across middle of body. 3. Number of transverse series of ventral plates. 4. Number of plates in collar. 5. Number of gular scales and granules between symphysis of chin-shields and median plate of collar. 6. Number of femoral pores (right and left, if differing). 7. Number of lamellar scales under fourth toe.

This variety inhabits Corsica and Sardinia, and has been recorded from Montecristo by Camerano. It bears a most striking resemblance to the Archipelagic vars. *milensis* Bedr. and *naxensis* Werner.

Var. TILIGUERTA.

Tiliguerta Cetti, Anf. e Pesci Sard. p. 15 (1777).

Lacerta tiliguerta Gmelin, Syst. Nat. iii. p. 1070 (1788).

Lacerta podarcis, var. *cettii* Cara, Mon. Lacert. Sard. p. 30 (1872).

¹ Types of *Zootoca quadrilineata* Gray.

² Received from Dr. de Bedriaga as typical of his var. *corsica*.

Podarcis muralis, var. *tiliguerta* De Betta, Atti Ist. Ven. (5) v. 1879, p. 389.

Lacerta serpa, part., Camerano, Mon. Saur. Ital. p. 56 (1885).

Head (Pl. XXVIII. fig. 7) once and a half to once and two-thirds as long as broad, rather strongly depressed, the occiput quite flat or even slightly concave, its depth in the tympanic region equal to the distance between the centre of the eye and the anterior border of the tympanum; snout obtusely pointed, as long as the postorbital part of the head.

Neck as broad as or a little narrower than the head. Body moderately depressed. Hind limb reaching between the collar and the ear in males, the axil, the shoulder, or the collar in females; foot once and one-sixth to once and a half the length of the head. Tail rounded in section, about twice as long as head and body.

Rostral shield never entering the nostril, and usually separated from the frontonasal by the nasals¹; postnasal single; frontal as long as its distance from the end of the snout or a little shorter; a series of granules between the supraciliaries and the principal supraoculars, the first of which is usually in contact with the first supraciliary; parietals once and one-third to once and four-fifths² as long as broad, rarely in contact with the upper postocular³; occipital as long as or shorter, and usually not broader, than the interparietal; temporal scales granular, small; tympanic shield distinct; masseteric shield usually small or absent; usually four upper labials anterior to the subocular⁴.

Collar even-edged or very slightly serrated, with 8 to 12 plates; 27 to 33 scales and granules in a longitudinal series between the symphysis of the chin-shields and the median collar-plate; gular fold distinct.

Dorsal scales very small, convex, round or oval-hexagonal, feebly but distinctly keeled; 65 to 77 scales across the middle of the body; 3 and 4, 4, or 4 and 5 transverse series correspond to one ventral plate, 45 to 58 to the length of the head.

Ventral plates in 6 longitudinal⁵ and 25 to 31 transverse series. Præanal plate rather small, with two semicircles of small plates.

Scales on upper surface of tibia feebly keeled, as large as or a little smaller than dorsals; 21 to 26 femoral pores on each side; 30 to 34 lamellar scales under the fourth toe. Upper caudal scales strongly keeled and truncate or very obtusely pointed; 30 to 40 scales in the fourth whorl behind the postanal granules.

Adult males (Pl. XXIX. fig. 5) are bright green or greenish yellow on the back, grey-brown on sides, limbs, and tail; the ocellus above the axil and spots on the outer ventral shields turquoise-blue; some adult females are bright green above,

¹ In two of the specimens examined, the rostral forms a suture with the frontonasal.

² As in some specimens of the vars. *bedriaga* and *sardoa*.

³ The contact is extensive in but one out of 20 specimens examined; it is very slight in two other specimens, absent in the 17 others.

⁴ Five on one side in two specimens.

⁵ The plates of the outer row are divided into two in one specimen.

while others, as well as young males, are reddish brown or greenish brown, without any green; the ocellus above the axil and the spots on the outer ventral shields pale blue or green¹. The dark brown or black markings of the body are of a more or less reticulate pattern, with a tendency to forming transverse bands, the meshes of the network enclosing round spots of the ground-colour (Pl. XXIX. fig. 6); the spots are usually larger and darker on the vertebral line, often forming an irregular or zigzag stripe in males. The reticulate dark markings either extend right across the back or an unspotted dorsal area exists on each side of the spine. The pattern of markings answers more or less to the *maculata-reticulata* and *maculata-tigris* types of Eimer, and may also approach very closely that of *L. bedriagæ*. Upper surface of head often with large black spots.

The lower parts are white, with mother-of-pearl gloss, and always unspotted.

A male specimen from Assemini, near Cagliari, sent to me alive by Count Peracca, is of a pale yellowish green on the back, with a pale reddish-brown network; a few black dots disposed irregularly on the vertebral line; limbs and sides greyish buff with pale greyish-lilac round spots; upper surface of head uniform pale brownish gold; a small turquoise-blue spot above the axil and a few others on the outer row of ventral shields; throat and belly white, slightly tinged with lilac-pink.

New-born young are unknown to me, but the smallest specimen I have seen (measuring 53 millim. from snout to vent) is reticulate, not striated.

Particulars of specimens examined:—

		1.	2.	3.	4.	5.	6.	7.
Cagliari	 ♂	73	71	26	10	30	25-26	32
"	 "	72	77	26	8	28	23-24	34
"	 "	70	68	26	11	27	23	32
"	 ♀	62	69	27	10	31	22-23	31
Assemini, nr. Cagliari	 ♂	70	70	28	11	33	24-23	33
S. Sardinia	 ♂	87	67	27	9	29	23	31
"	 "	84	82	26	9	31	23	30
"	 "	70	68	26	9	29	20	33
"	 "	62	75	25	10	33	25	30
"	 ♀	65	74	28	10	27	22-23	31
Sardinia	 ♂	75	74	25	8	30	26	31
"	 "	65	72	26	9	31	21-25	32
"	 ♀	70	66	29	12	28	23-22	31
"	 "	70	69	31	11	27	21-23	30
"	 "	53	65	29	12	27	22-21	33

Measurements:—

	♂.	♀.
From end of snout to vent	87	70
" " " fore limb	35	25

¹ These notes are taken from living specimens from S. Sardinia sent to me by Count Peracca.

	♂.	♀.
Length of head	23	16
Width of head	14	10
Depth of head	11	8
Fore limb	32	22
Hind limb	53	37
Foot	26	21
Tail	150 *	135

* Tail reproduced.

This variety is restricted to Sardinia if, as suggested further on, the Balearic and Tunisian specimens which are on record are the result of importation by human agency or have received erroneous indications of locality.

Var. BEDRIAGÆ.

Lacerta oxycephala, part., Dum. & Bibr. Erp. Gén. v. p. 235 (1839) ; Bedriaga, Arch. f. Nat. 1880, p. 250, pl. xi.

Podarcis oxycephala Bonap. Icon. Faun. Ital., Anf. (1840).

Lacerta oxycephala, var. *reticulata* Bedriaga, Bull. Soc. Nat. Mosc. 1881, p. 82.

Lacerta oxycephala Bedriaga, Arch. f. Nat. 1883, p. 260.

Lacerta oxycephala, var. *bedriagæ* Camerano, Zool. Anz. 1885, p. 418, and Mon. Saur. Ital. p. 48 (1885).

Lacerta bedriagæ Bedriaga, Abh. Senck. Ges. xiv. 1886, p. 284.

Lacerta muralis, var. *bedriagæ* Bouleng. Cat. Liz. iii. p. 34 (1887).

Head (Pl. XXVIII. fig. 8) about once and a half as long as broad, much depressed, the occipital region flat or slightly concave, its depth in the tympanic region equal to the distance between the centre or the posterior border of the eye and the anterior border of tympanum; snout more or less acutely pointed, not longer than the post-orbital part of the head.

Neck as broad as or a little broader than the head. Body much depressed. Hind limb reaching the shoulder, the collar, or a little beyond in males, the axil or the shoulder in females. Foot as long as the head or a little longer (not more than once and one-fourth). Tail round in section, rather strongly depressed at the base, once and a half to twice as long as head and body.

Rostral shield not entering the nostril; nasals forming a short or very short suture behind the rostral, or separated from each other¹; usually a single postnasal²; frontal as long as its distance from the end of the snout, or a little longer, or considerably shorter; supraciliaries separated from the principal supraoculars by a complete series of granules; parietal once and a half to once and three-fourths as long as broad, often

¹ In three specimens.

² Two superposed postnasals on both sides in two males (Bedriaga Coll. and L. Müller Coll.) and in one female (Lataste Coll.); on the left side in one male (Lataste Coll.) and in one female (L. Müller Coll.).

in contact with the upper postocular¹; occipital usually broader and as long as or longer than the interparietal, sometimes fused with it; supratemporal sometimes large, sometimes broken up into scales; temporal scales granular, not much larger than dorsals; tympanic shield present; masseteric shield moderately large, or small², or absent; four or five, rarely six, upper labials anterior to the subocular³.

Collar with even edge, with the plates usually small, 7 to 13 in number; 26 to 39 scales and granules in a longitudinal series between the symphysis of the chin-shields and the median collar-plate; gular fold usually distinct.

Dorsal scales smooth, granular and feebly convex, roundish-hexagonal and flat on the posterior part of the back, a little larger on the back than on the flanks; 62 to 78 scales across the middle of the body; 4 and 5 transverse series (rarely 4 or 3 and 4) correspond to one ventral plate, 30 to 56 to the length of the head. Ventral plates in 6 longitudinal and 24 to 28 transverse series. Præanal plate rather large, with a single semicircle of small plates, rarely with two.

Scales on upper surface of tibia minute, smaller than dorsals, likewise smooth; 19 to 26 femoral pores on each side; 26 to 31 lamellar scales under the fourth toe.

Caudal scales longer and shorter in alternate whorls, the upper feebly keeled, sometimes even nearly smooth, truncate behind; 28 to 40 scales in the fourth or fifth whorl behind the postanal granules.

Greyish, yellowish brown, or dull green above (Pl. XXIII. fig. 5), sometimes bright green according to L. Müller, with a more or less developed wide-meshed brown or blackish network, or blackish with round pale olive spots; small blue spots may be present on the sides: this form has lost all trace of striation, even in the young. Upper surface of head more or less spotted or vermiculate with black. Lower parts greyish or greenish white, salmon-pink, or copper-red, with or without small black spots; a series of green or blue spots on the outer row of ventral shields. Markings on the tail absent or ill defined in the adults (Pl. XXIX. fig. 7).

Measurements (in millimetres):—

	♂.	♀.
From end of snout to vent	73	70
" " " fore limb	30	27
Length of head	20	17
Width of head	13	12
Depth of head	9	8
Fore limb	27	25
Hind limb	42	37
Foot	21	19
Tail	137	112

¹ Out of 21 specimens examined, the postocular is in contact with the parietal in eight specimens, while it is so on one side only in a ninth.

² In seven specimens.

³ Five on each side in five specimens, 4 on each side in three, 6 on each side in one, 4 on one side and 5 on the other in twelve.

The secondary sexual differences of proportions are less marked ¹ in this than in other varieties of *L. muralis*.

I have examined 21 specimens, four of which form part of the Lataste Collection (collected by Dr. de Bedriaga), five are from Dr. de Bedriaga's Collection, and five have been sent to me by Mr. L. Müller.

		1.	2.	3.	4.	5.	6.	7.
Bastelica	 ♂	80	78	25	11	35	22	29
„	 „	75	77	28	10	35	25	?
„	 ♀	75	67	27	12	30	22-23	27
Tinozzo	 ♂	75	66	24	9	31	25	28
Vizzavona	 ♂	80	69	25	11	33	26-25	30
„	 „	80	66	25	11	33	24-26	31
„	 ♀	82	67	26	10	32	22	28
„	 „	80	62	26	11	26	21-19	27
„	 „	54	75	28	10	39	24	29
Corsica	 ♂	82	76	26	12	33	25	28
„	 „	78	66	25	10	32	26-25	30
„	 „	73	72	25	13	35	23-21	26
„	 „	65	71	28	12	33	24-23	29
„	 „	60	70	24	7	33	22-24	30
„	 „	58	58	24	9	32	23	27
„	 ♀	70	72	25	9	35	24-25	29
„	 „	55	70	26	9	32	23	27

Var. SARDOA.

The lizard recently described by Peracca as *Lacerta sardoa*, Boll. Mus. Torin. xviii. 1903, no. 458, from the Gennargentu, Sardinia, although very nearly related to the var. *bedriagæ*, cannot at present be united with it ². About a year ago, Count Peracca showed me the unique specimen he proposed to describe, and I fully agreed with him that it could not be referred to any described form. Its most striking peculiarity lies in the narrow head with the parietal shields nearly twice as long as broad; this, together with the coloration of the upper parts of the body—a black ground crowded with small greenish spots,—gives it a physiognomy very unlike that of the Corsican specimens. Since then, however, Count Peracca has succeeded in

¹ In a popular article on this variety (Blätter f. Aquarien- u. Terrar.-Kunde, xv. 1904, p. 356) Lorenz Müller adduces in favour of his view that it should be regarded as a valid species, the fact that, unlike *L. muralis*, *L. bedriagæ* shows no marked sexual differences of colour and that the young do not bear any trace of a light lateral streak. But such is also the case in the var. *nigriventris*, which surely no one would regard as a species distinct from the typical *L. muralis*. (See text-fig. 6 b, p. 399.)

² As has been suggested by L. v. Méhely (Allat. Közlem. Budapest, iii. 1904, p. 194), after having previously identified *L. sardoa* with *L. genéi*.

procuring a second specimen from the same locality, which more nearly approaches the var. *bedriagæ*, and which shows that the *L. sardoa* cannot be maintained as a species, although it probably deserves to rank as a variety distinct from the var. *bedriagæ*. I have been favoured by Count Peracca with the loan of the type and of the other specimen, and I have succeeded in procuring for the British Museum three further specimens from Signor Meloni, who obtained them in the same locality. Particulars and measurements of them are here given, for comparison with the tables of var. *bedriagæ* (pp. 412-13):—

	1.	2.	3.	4.	5.	6.	7.
♂	57	73	24	12	32	23-24	28
♀	78	68	25	12	33	25-26	31
♀	74	65	26	13	34	25-26	28
♀ (type)	70	72	26	13	35	25-24	29
♀	58	76	25	13	30	24-25	28

Measurements :—

	♂.	♀.			
From end of snout to vent.	57	78	74	70	58
„ „ „ fore limb	23	32	29	31	24
Length of head	15	19	17	19	15
Width of head	9	11	10	11	9
Depth of head	6	8	8	8	5
Fore limb	22	26	26	26	21
Hind limb	33	39	37	40	32
Foot	17	20	19	20	17
Tail	97	?	110	128	?

In all the specimens the rostral shield forms a suture with the frontonasal, the postnasal is single, the series of granules between the supraoculars and the supraciliaries is complete, the parietal is in contact with the upper postocular, the masseteric shield is very small or absent, the anterior upper labials are four in number, and the whorls of caudal scales are very markedly shorter and longer alternately. The parietals may be only once and two-thirds as long as broad. As pointed out by Peracca in his excellent description, there are a few extra femoral pores, forming an incomplete second series, in the type specimen.

The coloration of the type specimen has been described with sufficient detail by Peracca. His second specimen, smaller but also a female, differs in having the light dorsal spots larger and fewer and surrounded by a blackish network, much as in many specimens of the var. *bedriagæ*; dark markings are very indistinct on the olive-brown upper surface of the head, and the belly is uniform greyish, unspotted. In two of the specimens received from Signor Meloni, the light spots on the body and limbs are surrounded by black rings forming ocelli, between

which the ground-colour appears as narrow areas of a dark olive-grey; irregular black spots and round light dots are present on the upper surface and sides of the tail.

The type specimen is figured on Pl. XXIX. fig. 8, and the upper view of head on Pl. XXVIII. fig. 9.

The narrower head appears to be the only constant character by which this lizard can be distinguished from the Corsican var. *bedriagæ*, but it is sufficient for preventing us, at present, from uniting the two forms. It is also remarkable that the five known specimens agree in having the rostral broadly in contact with the frontonasal, a character which occurs but exceptionally in the var. *bedriagæ*.

VII.—NORTH AFRICA.

(Plate XXIX.)

Algeria is inhabited by a small form of *Lacerta muralis* very similar to the Iberian var. *bocagei*, except that the light dorso-lateral streaks are not so close together on the body. Specimens of this form from Oran and Tlemsen have been described as “variété verte” by F. Doumergue, ‘Essai sur la Faune herpétologique de l’Oranie,’ p. 124 (1901); while others, from Mascara, distinguished by the blackish-brown colour of the upper parts, have been named by the same author var. *fusca* (p. 125), a name already occupied. I have been favoured with the loan of two specimens from Mascara, and I have lately had an opportunity of examining a large number of lizards collected by Mr. Riegenbach in the Tamaruth Valley, Atlas of Morocco, which agree on the whole very closely with the Algerian specimens, and I have given a description of them, with figures, in the ‘Novitates Zoologicae,’ 1905, p. 75, pl. ii.

Specimens which I received long ago from Tangier, through M. H. Vaucher, differ considerably from the preceding, and probably deserve varietal distinction. I propose for them the name var. *vaucheri*, whilst retaining the name var. *bocagei* Seoane for the other specimens from Morocco and Algeria. A var. *tiliguerta* has been reported from Tunis, but I have reason to doubt the correctness of the locality.

Var. BOCAGEI¹.

My material consists of numerous specimens from the Tamaruth Valley, Atlas of Morocco (Riegenbach), several specimens from Tlemsen near Oran (J. Anderson), two (types of var. *fusca* Doumergue) from Mascara, and a few from the following Algerian localities in the Lataste Collection: Plateau de Serson, Aumale, Setif, Daya, Tebesa.

The depth of the head, in the tympanic region, equals the distance between the centre of the eye and the tympanum. The hind limb reaches the shoulder or the

¹ See above, p. 361.

collar in males, the wrist or elbow of the adpressed fore limb, or the axilla, in females; the length of the foot is once and one-sixth to once and one-third the length of the head.

The lepidosis is the same as in specimens from Spain and Portugal. Four is the normal number of upper labial shields in advance of the subocular¹; the series of granules between the supraciliaries and the principal supraoculars is complete or the first supraciliary is in contact with the second supraocular; the parietal shield is usually in contact with the upper postocular²; the masseteric shield is usually present, and often large, in the Moroccan specimens, and usually absent in those from Algeria. The edge of the collar shows no trace of denticulation, forming a perfectly even border³; 23 to 30 scales and granules along the middle line between the symphysis of the chin-shields and the median collar. The scales on the back are smooth or faintly keeled, 53 to 68 in number across the middle of the body, 3 and 4 transverse series corresponding to the length of a ventral shield, 40 to 60 to the length of the head. Ventral plates in 6 or 8 longitudinal, and 25 to 32 transverse series. Anal plate usually bordered by a single semicircle of small plates, rarely by two. Scales on upper surface of tibia a little smaller than dorsals; 16 to 22 femoral pores on each side; 22 to 28 lamellar scales under the fourth toe. Upper caudal scales rather strongly keeled, truncate; 26 to 34 scales in the fourth or fifth whorl behind the granules of the anal region.

Doumergue describes the Oran specimens as yellowish green above, with a greenish-yellow dorso-lateral streak, bordering a brown lateral band, the belly bluish white. In the Moroccan and Algerian specimens examined by me (in spirit), the colour is brownish, grey, or yellowish green, with two more or less distinct whitish streaks on each side, the upper extending to the supraciliary edge, the lower passing through the eye, separated by a dark brown band or by crowded black spots; the dorsal space between these light streaks is at least as great on the body as on the nape; brown or black dorsal spots are often present on the back, but they are irregularly disposed, or affect a paired disposition, never forming a vertebral line; upper surface of head uniform or spotted with black. Black ventral spots, if present, small and restricted to the sides. Tail with or without black and white spots, which may be very conspicuous and regular on the sides.

In the pattern of coloration, the North-African specimens often closely resemble the var. *liolepis* from Spain, but a dark vertebral line or series of spots is invariably absent, as in the Spanish and Portuguese specimens of the var. *bocagei*.

¹ One specimen from Tlemsen has 5 anterior upper labials on both sides; there are 5 on one side only in three specimens from the Tamaruth Valley, while there are only 3 on one side in a fourth.

² Nine exceptions from Tamaruth Valley, one from Sersou.

³ The collar-shields are very small and irregular in two specimens from Aumale.

Particulars of some of the specimens examined:—

				1.	2.	3.	4.	5.	6.	7.
Tamaruth Valley	.	.	♂	52	57	8	28	9	29	18-19
„	„	.	„	51	58	8	25	9	29	20-21
„	„	.	„	51	61	6	27	10	26	17-18
„	„	.	„	50	55	6	27	8	24	19-18
„	„	.	„	50	59	8	27	10	27	20
„	„	.	„	50	65	6	26	10	30	20-19
„	„	.	♀	52	64	6	31	8	30	20-21
„	„	.	„	50	58	6	30	8	26	17
„	„	.	„	48	55	6	29	9	28	18
„	„	.	„	47	55	6	28	8	27	19-17
„	„	.	„	46	57	6	30	9	25	16
„	„	.	„	45	56	6	32	10	28	17
Tlemsen	.	.	♂	56	56	6	25	11	24	18-17
„	.	.	„	54	61	6	27	8	27	18
„	.	.	„	52	65	6	27	10	29	21
„	.	.	„	48	60	6	25	10	27	19-18
„	.	.	♀	56	57	6	30	9	27	19
„	.	.	„	56	55	6	30	11	26	18-19
Mascara	.	.	♀	51	61	6	29	9	25	17
Sersou	.	.	♂	46	61	6	25	10	27	19-21
„	.	.	♀	48	60	6	28	9	24	16-17
Aumale	.	.	♀	57	57	6	30	12	26	17-16
„	.	.	„	50	65	6	30	11	27	17-18
Setif	.	.	♂	56	59	6	27	11	26	18-19
„	.	.	„	47	65	6	28	11	27	20-22
Tebesa	.	.	♀	42	56	6	30	11	26	17

1. Length from snout to vent (in millimetres). 2. Number of scales across middle of body.
 3. Longitudinal series of ventral plates. 4. Transverse series of ventral plates. 5. Number of plates in collar. 6. Gular scales and granules on a line from symphysis of chin-shields to collar.
 7. Number of femoral pores (right and left).

Measurements:—

	1.	2.	3.	4.
From end of snout to vent	51	46	52	56
" " " fore limb	20	17	21	21
Length of head	13	10	14	12
Width of head	8	7	9	8
Depth of head	6	5	7	6
Fore limb	18	15	20	17
Hind limb	27	22	30	26
Foot	15	13	17	14
Tail	89	83	95	87 *

* Tail reproduced.

1. ♂. Tamaruth Valley. 2. ♀. Ditto. 3. ♂. Tlemsen. 4. ♀. Ditto.

Specimens from the Atlas of Morocco have been figured by me in 'Novitates Zoologicae,' xii. 1905, pl. ii.; one from Tlemsen, near Oran, is represented on Pl. XXIX. fig. 10.

Var. VAUCHERI.

Like the preceding, this variety differs but little from the typical form, the principal distinction being in the smaller scales.

The head is rather short, not more than once and a half as long as broad, and moderately depressed, its depth, in the tympanic region, equalling the distance between the eye and the tympanum. The hind limb reaches the shoulder in males, the elbow of the adpressed fore limb in females; foot once and one-sixth to once and one-third the length of the head.

Head-shields as in the typical form, but parietals rather shorter, usually but little longer than broad; series of granules between the supraciliaries and the principal supraoculars complete, or first supraciliary in contact with the second supraocular; parietal in contact with the upper postocular, except in one specimen; masseteric shield present, except in one specimen; four upper labials anterior to the subocular (one specimen has five on one side, another has three).

Dorsal scales finely granular, distinctly keeled, 61 to 73¹ across the middle of the body, 3 and 4 transverse series corresponding to one ventral plate, 36 to 50² to the length of the head. Ventral plates in 6 longitudinal series. Scales on upper surface of tibia a little smaller than dorsals. 23 to 26³ lamellar scales under the fourth toe. Upper caudal scales moderately or strongly keeled, truncate or very obtusely pointed posteriorly.

Olive-grey above, with small black spots or reticulations; a more or less defined dark lateral band, bordered above by a whitish streak or series of white spots; no vertebral line or median series of spots; hinder side of thighs with round white spots; two series of white, black-edged spots along each side of the tail; belly uniform white in both sexes, or with a few scattered black dots; throat with black dots.

Particulars of specimens examined (as in preceding table):—

	1.	2.	3.	4.	5.	6.	7.
♂	52	68	6	26	10	30	18-19
„	49	70	6	24	10	25	17-18
♀	51	61	6	30	9	26	18-17
„	51	67	6	32	11	29	18-17
„	50	73	6	30	10	24	13-15
„	50	68	6	30	10	28	15-16

¹ 76 in the specimen from Algarve, described above, p. 365.

² 57 in the specimen from Algarve.

³ 23 in the specimen from Algarve.

Measurements :—

	♂.	♀.
From end of snout to vent	52	50
" " " fore limb	21	19
Length of head	13	10
Width of head	9	7
Depth of head	6	5
Fore limb	19	15
Hind limb	30	24
Foot	16	13
Tail	98	83

A female specimen is figured on Pl. XXIX. fig. 9.

Var. QUADRILINEATA.

Camerano long ago (Atti Acc. Torin. xiii. 1877, p. 87) recorded the occurrence of this form, described by him under the name of *L. tiliguerta*, in the vicinity of Tunis, where two specimens are reported to have been collected by the late Marquis O. Antinori in 1865. These specimens, preserved in the Turin Museum, have been kindly entrusted to me for study by Prof. Camerano, and I find one of them to agree in every respect with specimens of the var. *quadrilineata* from Sardinia and Corsica, while the other is referable to the Sardinian var. *tiliguerta*, as pointed out to me by Count Peracca. The association of these two specimens points to Sardinia as their country of origin, and as, since 1865, no one has ever found either of the Sardinian varieties in any part of Tunisia, I cannot help regarding it as highly probable that some mistake has taken place in the labelling of the specimens in the Antinori Collection.

It may perhaps be useful to give particulars of the two specimens preserved in the Turin Museum :—

	1.	2.	3.	4.	5.	6.	7.
♂, var. <i>quadrilineata</i>	60	63	27	11	31	22-23	31
♂, var. <i>tiliguerta</i>	63	72	27	10	28	23	30

The Lataste Collection contains three specimens, belonging to the var. *quadrilineata*, received from M. Ed. Taton as from Cyrenaica. These lizards agree entirely with Corsican specimens, and the fact that a *Lacerta vivipara* bearing the same indication of locality was received along with them makes me regard the information as doubtful, to say the least.

I have thus been unable to convince myself of the occurrence of either the var. *quadrilineata* or the var. *tiliguerta* in North Africa, and I consider the report of their presence there as based on erroneous indications of localities.

Tabular Synopsis of the Lepidosis in the Forms described.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
<i>F. typica</i>	42-62	2-3, 3-4, 4-5	28-45	6	23-32	7-12	19-30	13-25	22-28
<i>v. bocagei</i>	53-65	3, 3-4	36-60	6-8	25-32	8-12	23-31	13-19	21-29
<i>v. liolepis</i>	52-65	3-4	42-56	6-8	25-31	10-14	25-35	15-22	23-27
<i>v. vaucheri</i>	61-76	3-4	36-57	6-8	24-32	9-11	24-31	13-19	23-28
<i>v. monticola</i>	46-50	3, 3-4	27-34	6-8	28-29	9-10	22-25	17-20	23-24
<i>v. hispanica</i>	50-60	3-4	45	6	26-31	9-10	26-29	15-19	25-26
<i>v. pityusensis</i>	55-68	3-4, 4	35-47	6	26-30	9-14	26-34	19-24	26-31
<i>v. lilfordi</i>	70-90	3-4, 4-5	42-62	6	26-30	9-15	30-40	17-25	27-32
<i>v. breviceps</i>	46-55	2-3, 3	24-36	6	23-28	8-10	20-25	14-16	22-24
<i>v. brueggemanni</i>	51-65	3-4, 4	35-52	6	23-27	9-12	22-30	17-25	24-28
<i>v. nigriventris</i>	55-71	3-4, 4	37-51	6	24-29	8-12	22-29	18-23	27-32
<i>v. campestris</i>	53-65	3, 3-4	33-50	6-8	23-32	8-11	21-32	15-24	24-30
<i>v. serpa</i>	58-77	3-4, 4, 4-5	35-60	6	24-30	7-12	25-35	18-29	28-36
<i>v. filfolensis</i>	68-82	4-5	43-62	6	26-31	8-12	29-38	18-27	31-36
<i>v. quadrilineata</i>	56-75	3-4, 4-5	40-57	6	24-32	9-14	26-37	18-28	27-34
<i>v. tiliguerta</i>	65-82	3-4, 4, 4-5	45-58	6-8	25-31	8-12	27-33	21-26	30-34
<i>v. bedriagæ</i>	62-78	3-4, 4, 4-5	30-56	6	24-28	7-13	26-39	19-26	26-31
<i>v. sardoa</i>	65-76	4, 4-5	33-47	6	24-26	12-13	30-35	23-26	28-31

1. Number of scales across middle of body. 2. Number of transverse series of scales corresponding to one ventral plate. 3. Number of transverse series of scales corresponding to the length of the head. 4. Number of longitudinal series of ventral plates. 5. Number of transverse series of ventral plates. 6. Number of collar-plates. 7. Number of scales and granules in a longitudinal series between the symphysis of the chin-shields and the median plate of the collar. 8. Number of femoral pores on each side. 9. Number of lamellar scales under the fourth toe.